

# Railway Age Gazette

SECOND HALF OF 1917—No. 2

SIXTY-SECOND YEAR

NEW YORK: Woolworth Building  
CHICAGO: Transportation Building

NEW YORK—JULY 13, 1917—CHICAGO

CLEVELAND: Citizens Building  
WASHINGTON: Home Life Bldg.



## NEW SHOPS FOR THE BURLINGTON

W. C. K. recently completed large additions to the shops of the Chicago, Burlington & Quincy Railroad at West Burlington, Iowa.

The work consisted of the design and construction of a Power Plant, Blacksmith Shop, and a very large Locomotive Erecting and Machine Shop.

W. C. K. co-operate with their clients' own organizations in the design and construction of Railroad Shops, Terminals, and Power Plants.

**WESTINGHOUSE CHURCH KERR & CO. INC.**

ENGINEERS & CONSTRUCTORS

37 WALL STREET, NEW YORK

MONTREAL, Shaughnessy Bldg.

CHICAGO, Conway Bldg.

SAN FRANCISCO, Pacific Bldg.

**ENGINEERS and  
CONSTRUCTORS**

*A purely engineering  
organization with  
nothing to sell except  
services.*

**W.C.K.**



## CHASE GOAT BRAND PLUSHES AND CHASE IMITATION LEATHER

Quality standards are fixed and dependable  
Several months ago a seat cover of Chase Plush was sent to us with the  
statement that it had been in continual service for twenty-four years

**L. C. CHASE & CO.**

89 Franklin Street, BOSTON. 326 W. Madison Street, CHICAGO. 321 Fourth Avenue, NEW YORK. 303 Majestic Bldg., DETROIT.

THERMOSTATIC CONTROL  
PRESSURE VAPOR

**GOLD  
SYSTEMS**

COMBINATION ELECTRIC  
HOT WATER-VENTILATION

## IS YOUR HEATING MAINTENANCE CHARGE HIGH? WHY NOT APPLY A SYSTEM THAT WILL CUT THIS IN HALF?

Gold's Thermostatic Control System Saves 50% in Steam Consumption,  
Uses Less Pipe and Fittings—Positively Gives a Uniform Temperature.

*Thermostatic Control Can Be Applied to Your Existing Systems.*

**GOLD CAR HEATING & LIGHTING CO., 17 Battery Pl., New York**

## RAILWAY UTILITY COMPANY

*Sole Manufacturers*

"Honeycomb" and "Round Jet" Ventilators  
for Monitor and Arch Roof Cars, and all classes of buildings; also  
"Electric Thermometer Control"

*of Car Temperatures.*

721 W. FULTON ST.  
Chicago, Ill.

*Write for  
Catalogue*

1328 BROADWAY  
New York, N. Y.

## DICKINSON DEVICES

Cast Iron Smoke Jacks  
Light Fire-Proof Smoke Jacks  
Ventilators All Materials  
Cast Iron Chimneys  
Cast Iron Buildings  
Telephone Booths

**PAUL DICKINSON, Inc., 3354 South Artesian Ave., Chicago**

## SARCO MINERAL RUBBER ASPHALTS

SARCO No. 6 Waterproofing

SARCO Bituminous Fatty

SARCO E-M Paint

SARCO Refrigerator Compound

SARCO PRODUCTS INSURE PURITY AND RELIABILITY

*Promptness—Service—Efficiency*

SARCO PETROLEUM PRODUCTS COMPANY

Formerly STANDARD ASPHALT AND RUBBER CO., and

THE PETROLEUM PRODUCTS CO.

CHICAGO

SARCO Mineral Rubber Floors

SARCO Damp-Proofing

SARCO E. S. A. Specifications

SARCO Roof Cement

## Specify BUCKEYE JACKS

and be assured that you are getting the best jack in  
design, capacity and longevity that is manufactured

*Send for Catalogue*

**BUCKEYE JACK MFG. CO. ALLIANCE OHIO**

## The Rail Joint Company

61 Broadway, New York City



100% Rail Joint

Continuous, Weber, Wolhaupter and 100% Rail Joints.  
Standard—Insulated—Step—Frog and Switch  
Protected by Patents.

Grand Prize, San Francisco, 1915

## Better Observance of Signals Is Obtained By Using Cab Signals

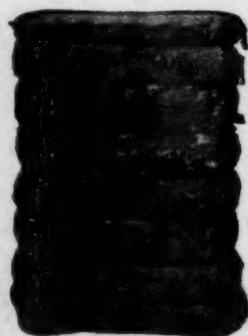
As developed in connection with the Simmen System, cab signals are practical, reliable, low in first cost and maintenance cost, and adaptable to a variety of traffic conditions.

**Simmen Automatic  
Railway Signal Co.**

1575 Niagara Street  
Buffalo, N. Y.

Write for our booklet  
"Progressive Signalling"

## Dexter P. Lillie Co.



Cotton and Wool  
**WASTE**

*Manufacturers of*  
Wiping and Packing  
Waste

**INDIAN ORCHARD  
MASSACHUSETTS**



**FOR** elevators, dredges,  
lumbering, mining, oil-  
well drilling, suspension  
bridges, stump-pulling,  
cranes, derricks, ships' rig-  
ging and every other form of  
wire rope use.

Ask for illustrated  
catalogue

**American Steel & Wire Company**

Chicago New York Cleveland Pittsburgh Worcester Denver

Export Representative: U. S. Steel Products Co., New York

Pacific Coast Representative: U. S. Steel Products Co.

San Francisco Los Angeles Portland Seattle

# Railway Age Gazette

Volume 63

July 13, 1917

No. 2

## Table of Contents

### EDITORIALS:

A Forward Step in Accident Prevention.....	47
A La Carte Versus Table d'Hote.....	47
The Interstate Commerce Commission Can Help.....	47
Increased Railroad Efficiency Reduced the Car Shortage.....	48
A Uniform Datum for Railway Elevations.....	48
The Draftswoman .....	49
Western Railway Club Drops Advertising.....	49

### NEW BOOKS

### LETTERS TO THE EDITOR:

"A Patriotic Duty"; Gustave E. Lemmerich.....	50
The Canadian Railway Problem; W. M. Acworth.....	50
The Barrel Carries Its Own Running Gear; Lacey Y. Williams.....	50

\* Illustrated.

### MISCELLANEOUS:

*Report of University of Illinois Fuel Tests.....	51
Washington Correspondence .....	56
Jury Blames Auto Driver for Accident.....	56
*Heavier Car Loading Is Winning Out.....	57
Furloughs for Pennsylvania Employees With the Colors.....	61
*Denver & Rio Grande Suffers Heavy Damage from Flood.....	62
*Increasing the Tonnage of Freight Trains.....	63
Reading Matter for Soldiers.....	68
*Pennsylvania Freight House at Indianapolis.....	69
*Duplex Locomotive Stoker.....	72
*Reconstruction of the St. Joseph Bridge.....	74

GENERAL NEWS SECTION .....	76
----------------------------	----

The railroads have long realized that grade-crossing accidents cannot be reduced appreciably until full responsibility

### A Forward Step in Accident Prevention

is placed not only on the railway companies but on the public as well. Unfortunately, this view has not been so generally held by governmental authorities, with the result that every additional accident has increased the payments of railroad claim departments and swelled the clamor for grade separation. It is, therefore, decidedly encouraging to learn that a Cook County (Ill.) coroner's jury recently rendered a verdict which recognizes that the persons using highway crossings may be entirely to blame for a grade-crossing accident and, when this is the case, should be severely punished. On May 13 an automobile was struck by a Chicago, Rock Island & Pacific passenger train at Midlothian, Ill., with fatalities to six occupants of the motor car and injuries to the driver. The circumstances, described elsewhere in this issue, were such that the coroner's jury found the driver guilty of carelessness equivalent to criminal negligence and manslaughter, and bound him over to the grand jury with a recommendation that he not be released without due process of law. The members of this jury are to be commended on taking a step which will have far-reaching effects in the interests of accident prevention. It is hoped that this verdict will impress upon chauffeurs that prison cells may await those who are recklessly indifferent to danger, even when a railroad is involved.

The following letter has been received from the passenger traffic manager of a large railway system: "I have been

### A la Carte Versus Table d'hote

interested recently by *Railway Age Gazette* editorials on dining car waste of food, and have been wondering why a la carte has been charged with the fault of food waste and table d'hote credited with saving food, whereas the contrary has been proved in every case. We have experienced both methods, and for many years operated our dining cars on the table d'hote plan, which requires not only the preparation in advance of a lot of food, much of which is not used, but permits the passenger to order many things not wanted,

which are merely tasted, and have to be thrown away, and allows the waiter to bring food not ordered, but which he thinks may assist in obtaining a larger tip. The waste of a steamship on the table d'hote plan is not so great proportionately as in the dining car or in a hotel, for the reason that the crew has to be fed, and owing to the conditions of such service can be fed less expensively than dining car help or hotel help. If in certain dining cars too large portions are served, it is not the fault of the a la carte system, but the fault of the head of the dining car department, who does not arrange to cut down the size of the portions. Our practice has been to serve a reasonable sized portion, but even this method has not kept down the prices, which have had to be raised owing to the great advance in the cost of food." The editorials referred to were not meant to condemn the a la carte system on dining cars as necessarily more wasteful than the table d'hote, but rather the wastes, which occur under the a la carte system as it has been operated on most railways. Under the present condition the system which will best conserve foodstuffs is the one which should be used; and experienced railway officers are the best judges as to which will the more effectively further that object.

In many cases it is the receiver of freight who specifies the quantity shipped as a carload. The receiver of freight

### The Interstate Commerce Com- mission Can Help

is even harder to reach and to get co-operation from in the matter of heavier carloading than the shipper. A very interesting suggestion has been made by a large shipper in Texas who, while expressing himself as glad to co-operate with the railroads in using any circulars on heavier carloading and distributing them among receivers of freight, makes the point that any marked activity on the shippers' part will probably be taken as merely an endeavor to increase the size of sales. The receiver of freight even more than the shipper of freight suspects a railroad of merely trying to serve its own ends when heavier carloading is urged by the railroad company itself. It is a well known fact that an impartial outsider can recommend a certain course to one of two parties who have continuous business dealings and get an open-

minded consideration that would not be accorded to the same recommendation made by one of the interested parties. The Interstate Commerce Commission is looked upon by the shippers as impartial, at least, if not actually an ally of the shippers. It has a standing and its recommendations carry a weight with shippers and receivers of freight as well as with the general public that is unique. In the present crisis a strong recommendation made by the Interstate Commerce Commission to shippers and receivers of freight that they co-operate with the railroads in their efforts toward getting heavier carloading would be of immense value; a general appeal by the Interstate Commerce Commission would be heeded by a vast number of receivers and shippers of freight who would look upon the appeal by the railroads themselves simply as a business move, to be met as any other business move would be met. Might it not be possible, feasible and proper for the Interstate Commerce Commission to make such an appeal? The Commission has on some occasions issued circulars, addressed jointly to carriers and shippers, urging prompt loading of cars and prompt movement, but has never, so far as we know, made an appeal for the full use of car space. The question is important enough to the nation to justify such an appeal. Would not this be a constructive piece of work for the Interstate Commerce Commission to undertake?

### INCREASED RAILROAD EFFICIENCY REDUCED THE CAR SHORTAGE

THE statistics now available demonstrate that the reduction of the net car shortage from 148,627 cars on May 1 to 105,127 on June 1, or about 30 per cent, was due to increased efficiency in railway operation, because they show that it was accomplished in spite of a large increase in freight traffic in May.

While statistics regarding the volume of traffic handled in May are not yet available in complete form, an indication of the increase in the amount of business for which the railroads were called upon to furnish cars in that month is afforded by the freight earnings of the roads that have already reported their monthly earnings to the Interstate Commerce Commission. One hundred and forty-eight roads in all parts of the country have filed their May earnings reports with the Commission, and these roads showed an increase in freight revenues of 10.14 per cent in May as compared with April. This increase in freight revenue indicates a corresponding increase in the total amount of freight carried, and is the best possible evidence of the results being gained from the work of the Railroads' War Board and its sub-committee, the Commission on Car Service, in co-ordinating the facilities of the railroads for the purpose of increasing their efficiency during the war. It also shows that they are receiving increasing co-operation from shippers in loading cars heavily and in loading and unloading them more quickly. The new car service regulations, under which box cars are virtually pooled, were put into effect by order of the Railroads' War Board on April 26, and since that time the Commission on Car Service has ordered those railroads on which cars have accumulated in congested territories to turn over to roads on which there has been a shortage, cars to the number of over 56,000, which have been sent largely in full trains to the points where they have been most needed.

The Railroads' War Board has also received reports indicating a considerable increase in efficiency on the part of the railroads in April. Figures from 51 per cent of the mileage of the railroads in the United States show that they carried over three billion more tons of freight one mile in April, 1917, than they did in April, 1916, an increase of 16 per cent, and that this was done with an increase of but

4.3 per cent in locomotive miles and with but 5 per cent more freight car miles. The average train load was increased 66 tons—a remarkable achievement—and the average carload was increased 2.4 tons.

These figures for April and May make a very good showing of increased efficiency gained under the greatest difficulties; but they should not cause any misleading optimism. With railway traffic continuing to increase at the rate it is, it is evident that even though the railways and shippers use the transportation facilities available to the best purpose possible, there probably will be another big car shortage and acute congestion this fall.

### A UNIFORM DATUM FOR RAILWAY ELEVATIONS

ONE of the most important benefits which the railways are securing from the Federal valuation work is the opportunity to complete and bring up to date their maps, profiles and other records. Previous to the inauguration of this work few roads had complete, accurate records of their properties, but the demand of the government for maps and profiles has forced them to prepare the information which they had long desired but had neglected to collect because of the expense. In view of the large mileage of profiles now being run in connection with this work, a publication just issued by the United States Coast and Geodetic Survey on the advantages of the universal adoption of mean sea level as the datum for all levels is of special interest.

In the earlier periods of development of this country it was natural and in fact necessary to assume elevations to start from. It was in this way that the early railways laid their grade lines and built their roads. As other railroads, each with its individual system of elevations, crossed these lines confusion arose and this has been increased as large communities have developed along the railways, each with its individual system of elevations. The result has been an entire lack of uniformity of elevations in the same locality, leading to confusion and needless duplication of work. To provide a universal and at the same time an accurate basis for elevations throughout the United States the Coast and Geodetic Survey is extending a network of precise level lines across the country with permanent bench marks at frequent intervals. These lines of elevations which have mean sea level for their datum plane, aggregated 35,500 miles in December, 1916, of which about 2,500 miles was added last year and 11,500 miles since 1907.

The advantages of a uniform system of elevations for national, city, railway and other work should be evident to all engineers. Many of the railways have already adopted the basis used by the Geodetic Survey and this action should become universal. It is true that the transition from the old to the new datum will necessitate the careful tying in of old records and elevations to the new basis but once this has been done the benefits resulting from uniformity will far outweigh the temporary disadvantages. Because of the wide areas traversed by single railway systems and the large number of communities which they serve the influence of the railways in adopting this datum plane will be important in securing its acceptance in many communities along their lines.

This will simplify much of the work of the railways in these communities where it is frequently of advantage to them to utilize existing records and elevations established in those cities in the planning of new work, etc. Because of the wide scope of their activities it also frequently becomes necessary for railways to compare elevations between widely separated points, frequently removed from their lines. By uniting with the Coast and Geodetic Survey in the establishment of a uniform datum throughout the country the rail-

ways can lend important aid in this work which will be of increasing benefit in the conduct of engineering work of all kinds from year to year.

### THE DRAFTSWOMAN

ONE of the most recent manifestations of war influences is the employment of women in railway drafting rooms, the natural result of the general shortage of draftsmen, which has placed a serious handicap on engineering work for some time. Many of the railway valuation offices have been short of men necessary to draw the right of way maps and profiles required by the government and are far behind their schedules, while structural detailers are now commanding 30 to 40 per cent more than the normal scale of wages. Moreover, these conditions promise to become worse when the selective draft is put into effect, since a very large proportion of the draftsmen come within the prescribed age limits. The conditions seem logically to suggest the use of women in drafting rooms. This offers immediate relief, while promising some economies in certain classes of work. To this end the Santa Fe recently gave employment to 12 girls in its Chicago office, another western road has made a start in this direction and at least one eastern road has the matter under immediate consideration.

A considerable part of the work of the drafting room requires no qualifications other than skill in the use of drawing instruments, an accomplishment depending largely upon natural deftness and neatness which are usually more highly developed in women than in men. Tracing, for instance, offers the most immediate opportunity for employment for women, since it is almost entirely a matter of mechanical skill, and many drafting rooms even now are organized to employ certain members exclusively in the tracing of drawings made by others. The plotting of survey notes, earth work cross sections, lease plats, etc., can unquestionably be learned by a bright girl in a short time. In architectural drafting the ability of women has long been established, although only a few are employed. On the other hand, in the field of mechanical or structural detailing, the preparation of track layouts, and other work requiring technical training or at least a fair knowledge of shop practice or field conditions, the immediate usefulness of the draftsman will be limited.

Judging by conditions in other countries women will be employed throughout the course of the war in as large a measure as they show themselves capable of doing the work. There is also every reason to believe that, once they have become established in a given class of work, they will continue to take the place of men even after the close of the war, since economic pressure is continually bringing about the replacement of men by women in many commercial and industrial activities. The mechanical operations required for the making of drawings are not of such a nature that the greater physical strength or mental training of men is of any particular advantage. Consequently the draftsman must expect continued competition from the draftsman, and except in the case of the real designer or engineer-draftsman, he may possibly be driven from the field. Even the technical man will feel the pressure of this competition, since his superiority in education and training will constantly be measured against the greater wage which he must demand as the head of a family. Up to the present time, women have been excluded from drafting rooms principally because engineers have hesitated to make the necessary changes in organization that would permit the employment of both men and women in the same office. Through the agency of the war they are now compelled to make these changes, and with women once employed, economic laws will assert themselves.

### WESTERN RAILWAY CLUB DROPS ADVERTISING

THE Western Railway Club has taken an advanced position among railway organizations by abolishing advertising from its proceedings. This source of revenue is one of the most important financial bulwarks of some associations and clubs in the railway field, and has become so well recognized that probably very few men outside of those who pay the bills have stopped to consider whether the advertising is worth anywhere near what it costs the supply companies. Both the railway and supply men in the Chicago club referred to above, who held membership on an equal basis in all respects, did give such consideration to this question, however, and decided that there was ample ground for changing their long existing policy. The supply men were frank in the opinion that, as an advertising medium, the club proceedings were of little value, and further, that as a method of securing donations from the supply industry for the support of the club, this method is very inequitable. The railway men were quick to see the possibility of decreasing the total expenses for publication very materially by the elimination of advertising, and were entirely willing to take this step if the necessary revenue could be secured in other ways. The decision finally reached in regard to this necessary revenue was to divide the membership into two grades—active and contributing—the former for railway men with dues of \$2 a year, and the latter for supply men with an annual rate of \$5.

The elimination of advertising support is undoubtedly an important step in the right direction, for the dangers of abuse in handling it in association publications are too numerous to be entirely avoided in most organizations. The real problem to be faced in considering such a move is how to make up the loss in revenue. The supply men in the Western Railway Club raised no objection to the assessment on them of a higher rate of dues, on the basis that such a club membership is a business proposition for a supply man, and is well worth this cost. While in this case the action taken may be a fairly satisfactory solution of the problem, it falls considerably short of the ideal arrangement.

Any organization of railway men is either of definite value to the men and to the roads they represent, or it is not. If it is, it deserves adequate financial support. If it is not, the quicker it dies from lack of support, the better. Either the railway men who are members of such an organization are able to support it, or they are not. If they are, the solution of their problem is found. If they are not, the railways ought to support the organization collectively. Either an association has a real place in its membership for the technical men employed by supply companies, or it has not. If it has, these men ought to be admitted to some grade of membership. If it has not, such members should not be accepted. The practice of deriving financial support for a railway organization from supply men, either through advertising which does not bring the advertiser value received, or through high rates of membership, is only in effect passing the cost back to the railways indirectly and they can much better afford to bear it directly.

### NEW BOOKS

*Poor's Manual of Public Utilities.* 2,400 pages, 6 in. by 9 in., bound in cloth. Published by Poor's Manual Company, 80 Lafayette street, New York. Price, \$10.

This book contains an alphabetical list of public utility companies in the United States and Canada, with pertinent facts concerning the physical property of each, the territory served, the capital stock, the funded debt, and the directors and officers. In addition, the Manual shows the "marginal safety" over interest and dividend requirements of individual bonds and stock.

## Letters to the Editor

### "A PATRIOTIC DUTY"

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In war it is of the utmost importance that the railroads shall be able to handle a vastly increased traffic in an efficient manner.

In most European countries this principle has long been recognized. The governments have provided the roads with facilities, demanded by defense boards, and have enacted laws in regard to private railroads, regulating how the work shall be done, payments and compensations be made, etc.

This has all been prepared in peace times. Now we are in a great war and the Interstate Commerce Commission practically has denied the increases in freight rates asked for by the railroads to meet the extraordinary demands of the war traffic, also the increases in wages, cost of supplies, etc., to strengthen their credit to cope with any emergency and to give their securities the stability to weather storms.

Moreover, our roads have few of the facilities, etc., required for military purposes and which mostly have no commercial value.

One thing is dead sure—the railroads must be provided with increased revenues to meet existing conditions and above all, they need them at once. In war quick decisions are imperative and fussing about trifles is out of place.

The safety and the commerce of our country demand it. Congress has the power to do this and it should perform this patriotic duty without delay.

GUSTAVE E. LEMMERICH.

### THE CANADIAN RAILWAY PROBLEM

LONDON, England.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I value highly your opinion, and regret that you do not approve of the solution of the Canadian railway problem recommended in the majority report. I do not think it would be proper for me to argue with you. But without arguing I should like to deal with two points in your article.

You think that our proposed board of trustees "would be a clumsy device for management"; you say that "any commercial concern, to be successfully managed, must have its executive work conducted under the direct supervision not of five men but of one man." I agree, and that is what is proposed. We have recommended that there should be three trustees, the best railway men that can be obtained. Let us call the chairman the president, and the two other whole-time trustees vice-presidents. We have recommended this board should be completed by the addition of two other members not required to give their whole time; and we have assumed that they will leave the normal management of the railway to the president and his two vice-presidents. The only difference between our proposed board of trustees and the ordinary railway board of directors is that we have limited the number of non-experts to two. The reason for this is obvious and I will refrain from stating it.

Further, you express yourself in favor of a scheme "under which the ownership and management of the present private railways would be left in private hands" and "the enterprise and efficiency of private management" retained. I agree, but unfortunately am compelled to add the words "if possible."

I invite you to re-peruse pages 49 and 50 of our report. If we have come to a wrong conclusion in saying that a private company certainly could not be formed in Canada, probably could not be formed outside Canada, while in any

case formation outside Canada would be open to the gravest objection, I invite you to put us right. If you will work out in such detail as to permit of fruitful criticism a private company scheme that in your judgment will meet the situation, you will confer an important service on the people of Canada. For my part, six months' study of the question has taught me that to desiderate or even to adumbrate a scheme is one thing, to work it out in practical detail of dollars and cents is quite another. The former is easy and valueless, the latter, I have been reluctantly constrained to believe, is, under the circumstances, impossible.

W. M. ACWORTH.

### THE BARREL CARRIES ITS OWN RUNNING GEAR

OAK HARBOR, Ohio.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was much interested in the article on page 613 of the March 23 issue of the *Railway Age Gazette*, entitled "Better Freight Containers a Necessity."

This question has been one to which I have given a good deal of thought during my 25 years' connection with my coöperation business.

My deductions from my experience as a manufacturer of packages and as a shipper of various types of packages is that the barrel is the strongest, most portable, most sanitary container; that it has the greatest range of use and that it is the cheapest of all packages, without exception when weight and contents are considered.

Take the transportation question alone. One man will unload a carload of 200 barrels of sugar, weighing an average of 360 lb. each in less than an hour, and not injure a barrel in the slightest way.

On the other hand, no container has ever been produced of a rectangular shape, that could be handled at all with this weight by one or even two men. Even with rectangular containers weighing only 100 lb. each, every one must be lifted bodily and carried or trucked. A barrel can be rolled any distance. In other words it carries its own running gear with it.

The contents of a barrel are protected from damage from leaky car roofs and from rain during loading and unloading or when on platforms, which would be fatal to contents of a fiber container.

Taking the question of a reward for a proper container, or more particularly as to a low rate on its return journey, shipping the barrels empty is not necessary, for the reason that they can be used for any kind of product when empty and always find an eager market, returning full as it were.

The empty barrel itself weighs less than any container ever produced, capacity considered. Metal packages foul in shipping empty, and sometimes rust, while the empty barrel is bright and clean.

The classification on goods shipped in barrels should be lower than on similar goods shipped in rectangular containers for four reasons:

First—There are fewer damage claims.

Second—A freight crew will handle ten times the tonnage in barrels that it will in regular containers.

Third—Cars can be unloaded in one-tenth the time, and under weather conditions that with other containers might prevent the release of the car.

Fourth—The barrel is more sanitary; this is the most important, although it does not enter into the calculation of transportation companies as do the first three.

As a matter of fact, I maintain that in the barrel we have had the best and the cheapest container with us for some time, and that it would be money in everybody's pocket if this were more generally understood.

LACEY Y. WILLIAMS.

# Report of University of Illinois Fuel Tests\*

## Determination of the Relative Value of the Various Grades of Illinois Coal for Use in Locomotive Service

THE tests, the results of which are here set forth, were made by the Railway Engineering department of the University of Illinois in cooperation with the committee on Fuel Tests of the International Railway Fuel Association and the United States Bureau of Mines. Their general purpose was to determine the relative value in locomotive service of various grades of coal.

For this purpose six sizes of coal chosen by the International Railway Fuel Association committee were tested in the locomotive laboratory, on a Mikado type locomotive loaned by the Baltimore & Ohio. These grades were mine

the coal is undercut with electric chain machines. The coal face and the mine itself are quite uniformly dry.

As promptly as possible after its receipt at the laboratory—on the average six days, and in no instance more than 12 days after its arrival—the coal was unloaded into covered bins where it remained protected from the weather until used. The cars were unloaded by hand shovelling about as they would have been at some of the older types of railway coal pockets, and the coal was probably subjected to about the same amount of breakage in this process. The maximum time elapsed between loading the coal at the mine and testing it was 37 days in one instance. Taking the tests as a whole the average time between loading and testing was about 25 days.

**Chemical Analyses.**—During the progress of each test while the coal was being loaded into the charging wagons to be taken to the firing platform, samples were taken for the purpose of analysis. These samples varied in amount from 500 to 1000 lb., and they were taken according to methods prescribed by the American Society for Testing Materials as set forth in the year book of the society for 1915. The averages of the coal analyses for all tests made with each grade of coal are presented in Table I. An inspection of this table reveals a rather unusual uniformity among the various

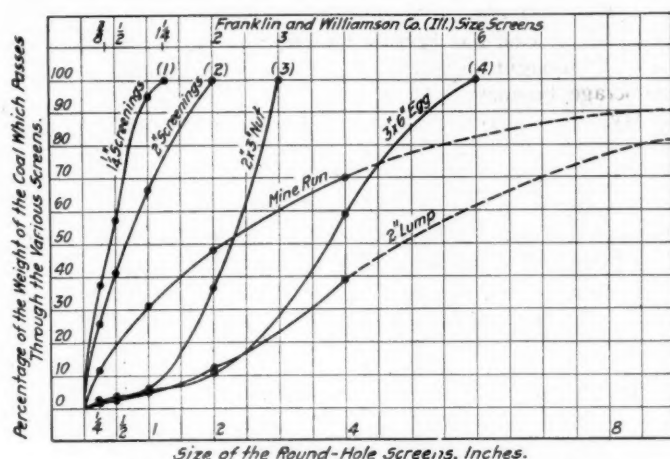


Fig. 1—Make-up of the Coals as Received

run, 2-in. by 3-in. nut, 3-in. by 6-in. egg, 2-in. lump, 2-in. screenings, and 1 1/4-in. screenings, all from United Coal Mining Company's Mine No. 1 at Christopher, Franklin County, Illinois.

The general test program involved for each grade of coal six tests, three of which were made at a medium rate of evaporation, and the remaining three at a high rate. The medium rate was chosen to represent an average rate of working the locomotive, in so far as it is possible to define such an average. During tests run at this medium rate about 23,000 lb. of water were evaporated an hour under the prevailing conditions, from 3,100 to 4,300 lb. of coal were fired per hour, and the engine was worked at 33 per cent cut-off and at about 19 miles an hour, developing approximately 1,300 indicated horse power and about 22,500 lb. drawbar pull. During tests when the engine was worked at the high rate of evaporation, about 43,000 lb. of water were evaporated an hour, the hourly coal consumption varied from about 7,000 to 9,300 lb., the cut-off and speed were respectively 55 per cent and 26 miles per hour, while the horse power was about 2,200, and the drawbar pull about 28,500 lb.

### THE COAL USED

The coal used is derived from what is designated by the Illinois Geological Survey as bed No. 6 of the Carboniferous Age, Carbondale formation. The bed averages in thickness about 9 ft. 5 in. and carries almost throughout, at from 18 to 30 in. from the floor, a "blue band" variable in thickness and consisting of "bone," shaly coal, or gray shale. The mine is worked under the room and pillar system and

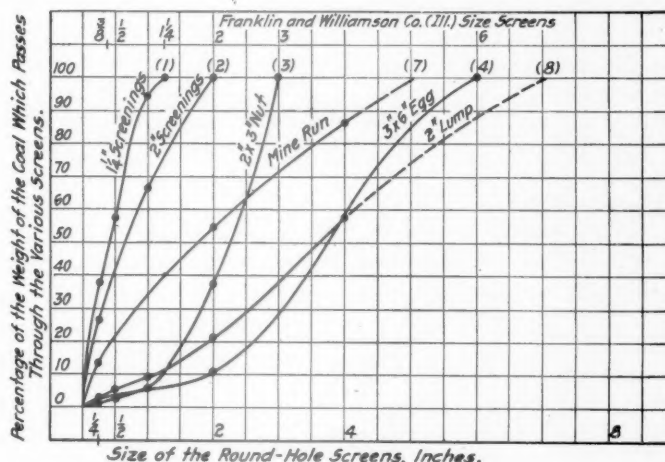


Fig. 2—Make-up of the Coals in the Condition in Which They Were Fired

grades as regards their composition and heating value. The analyses for the two sizes of screenings correspond very closely in all respects and their average heating value, based on dry coal, was only about 2 per cent less than the average heating value of the four larger grades. The uniformity of the analyses and of the heating values make it clear that such differences in performance as developed between the various grades are due chiefly to differences in their mechanical makeup, and only in small measure to differences in their chemical composition.

**The Make-up of the Coals.**—Due to differences in the nature of the coal, in mining methods, and in methods of preparation, there is frequently much uncertainty about the meaning of such terms as "mine run," "lump," etc. The laboratory has devised a method of screening samples of the coals used during tests for the purpose of separating them into their size elements in order to be able to define and record the actual mechanical make-up of the various grades.

\*Abstract of a committee report presented at the 1917 convention of the International Railway Fuel Association.

All the coals used in these tests were thus screened and this process is referred to as the mechanical analysis.

Three carloads each of mine run and lump, and two carloads of each of the other four grades were received at the laboratory. For both the mine run and the lump coals two of the three carloads of each grade were sampled for screening. Samples were taken from each car of nut and each car of egg, whereas the two cars of 2-in. screenings and the two cars of 1¼-in. screenings were merged for each grade and one sample only was taken from each size. There were thus taken for mechanical analysis a total of 10 samples, each of which weighed about two tons.

These samples were screened by means of a specially designed shaker screen operated by pulley-driven eccentrics

a considerable proportion of lumps too large for proper firing, the attempt was made to break these two grades down to the extent to which, in the judgment of those in charge of the tests, these grades are generally broken down at the coal chute. These two coals as fired contain, therefore, a smaller proportion of large lumps than when they were received and the extent to which this extra preparation modified the make-up of the coals is defined in Fig. 2.

#### THE TESTS

The locomotive used during the tests was loaned for the purpose by the Baltimore & Ohio. It is of the Mikado type and was built by the Baldwin Locomotive Works during the summer of 1916. It entered service in September, and upon

TABLE I.—THE CHEMICAL ANALYSIS AND HEATING VALUE OF THE COALS.

Grade of coal	Proximate analysis, coal as fired					Calorific values			Ultimate analysis, coal as fired				Moisture in coal determined from sample taken at mine, per cent
	Moisture, per cent	Volatile matter, per cent	Fixed carbon, per cent	Ash, per cent	Sulphur separately determined, per cent	Per lb. of coal as fired, B.t.u.	Per lb. of dry coal, B.t.u.	Per lb. of combustible, B.t.u.	Carbon, per cent	Hydrogen, per cent	Nitrogen, per cent	Oxygen, per cent	
Mine run .....	8.14	34.18	47.92	9.76	0.95	11,873	12,926	14,463	66.63	4.28	1.55	8.69	7.82
2-in. by 3-in. nut. . .	8.60	34.83	47.70	8.87	0.88	11,957	13,082	14,487	67.50	4.36	1.38	8.42	8.48
3-in. by 6-in. egg. . .	8.82	34.57	48.56	8.06	0.94	12,071	13,239	14,523	68.19	4.50	1.51	7.99	...
2-in. lump .....	9.27	34.46	47.49	9.07	0.88	11,817	13,023	14,469	66.34	4.23	1.49	8.73	...
2-in. screenings....	9.25	32.05	48.12	10.59	0.85	11,550	12,727	14,408	65.74	4.43	1.48	7.66	...
1½-in. screenings... .	9.09	32.34	48.01	10.57	0.97	11,557	12,711	14,385	65.49	4.35	1.43	8.10	9.07

running at a speed of 80 revolutions per minute. Five screens were used perforated respectively with 4-in., 2-in., 1-in., ½-in. and ¼-in. holes. In this way the sample was divided into six parts whose size limits were as designated by the headings of columns 2 to 7 in Table II. These parts were then weighed and the ratios of their weights to that of the original sample were calculated.

Table II presents the average values of these ratios and it defines, therefore, for each grade the magnitude of the size elements which went to make up the original coal and thus records definitely its composition.

The facts embodied in Table II may be re-combined to permit graphical definitions of the grades in another form. Considering the 2-in. by 3-in. nut coal, if we add columns 4 to 7 we find that 36.1 per cent of this coal passes through a 2-in. screen. Adding columns 5, 6, and 7 we find that

its arrival at the laboratory, had run approximately 3,400 miles. It arrived at the laboratory in excellent condition. The principal dimensions of the locomotive are as follows:

Total weight, in working order.....	284,500 lb.
Weight on drivers.....	222,000 lb.
Cylinders (simple), diameter and stroke, in.....	26 by 32
Diameter of drivers.....	64 in.
Grate area.....	69.8 sq. ft.
Heating surface, total (fire side).....	3,630 sq. ft.
Heating surface, superheater (fire side).....	1,030 sq. ft.
Boiler pressure, lb. per sq. in.....	190
Tractive effort.....	54,587 lb.

The boiler was of the wagon-top type with radial stays. It was equipped with a Schmidt top-header superheater consisting of 34 elements, a Street stoker, and a Security brick arch carried on four tubes. The front end was self-cleaning and was equipped with a plain 6-in. round nozzle-tip without bridge or spl't. which was used throughout all tests. The total air opening through the grates amounted to 17 sq. ft.

TABLE II.—SIZE ELEMENTS OF THE COALS AS RECEIVED AT THE LABORATORY.

Grade of coal	Per cent over 4-in. screen	Per cent through 4-in., over 2-in. screen	Per cent through 2-in., over 1-in. screen	Per cent through 1-in., over ½-in. screen	Per cent through ½-in., over ¼-in. screen	Per cent through ¼-in. screen	Total
1	2	3	4	5	6	7	8
Mine run .....	29.6	22.3*	16.8*	11.4	7.4	12.5	100.0
2-in. by 3-in. nut.....	...	63.9	30.3	2.8	1.1	1.9	100.0
3-in. by 6-in. egg.....	41.0	48.3	5.3	2.0	1.1	2.3	100.0
2-in. lump .....	61.6	26.4	7.5	1.9	.9	1.7	100.0
2-in. screenings.....	...	...	33.2	25.7	14.2	26.9	100.0
1¼-in. screenings.....	...	...	4.5	37.9	20.0	37.6	100.0

\* Derived from plotted curves (Fig. 1).

5.8 per cent. will pass through a 1-in. screen, etc. Obviously also 100 per cent of this grade passed a 3-in. screen in the original preparation at the mine. The six curves drawn in Fig. 1 are plotted from the percentage values thus obtained for each of these grades. Those portions of the curves drawn with broken lines are not supported by direct experimental data. The scale shown in the upper part of the diagram represents the screen sizes which are commonly used in the mines of southern Illinois.

All grades except the mine run and lump were unloaded into the charging wagons from the bins without further preparation and they were consequently fired in exactly the condition in which they arrived at the laboratory, except for the breakage incident to unloading and the insignificant breakage due to shoveling into the charging wagons. Since, however, the mine run and the lump coals contained as usual

or 24.4 per cent of the grate area. The area of the air inlet to the ash pan amounted to 8.3 sq. ft. or 49 per cent of the air opening through the grates. The locomotive was regularly equipped with a hand-operated door which was replaced during the period of the tests by a Franklin pneumatic door of the butterfly type. This was used during all tests except those with the two sizes of screenings, which were fired by means of the Street stoker.

Throughout each medium rate test, the time of firing the last scoopful of each ton was recorded, together with the levels of the water in the main feed tank and in the boiler gage glass. During the high rate tests, these facts were recorded at the time of firing the last scoopful of each two tons of coal. This procedure made it possible to control the regularity of the firing process and it also makes available facts which may be used to illustrate the regularity of

feed of both the coal and the water. For this purpose tests 2,405 and 2,416, fairly characteristic of the series, have been chosen. During test 2,416, run at a medium rate of evaporation, the time required to fire each of the 10 successive lots of 2,000 lb. varied only from 34 to 36 minutes; and the amount of water fed per minute during these 10 intervals varied only from 390 to 413 lb. During test 2,405 which was run at a high rate of evaporation, the times required to burn each of the five successive lots of 4,000 lb. of coal were respectively 36, 33, 31, 32 and 31 min.; and the water fed per minute during these intervals varied only from 693 lb. to 709 lb.

An inspection of the values of equivalent evaporation per

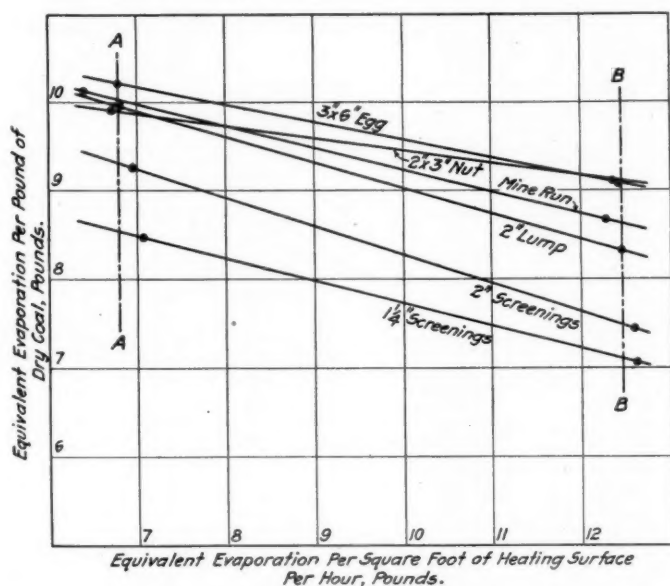


Fig. 3—Relation Between Equivalent Evaporation per Pound of Dry Coal and the Rate of Evaporation

pound of dry coal as obtained from each test disclosed great uniformity among the values applying to each grade of coal and each rate of combustion. Only in the case of the high rate tests with the 2-in. lump coal is there any considerable variation between the equivalent evaporation values for the individual tests and even in this group the maximum variation from the average is only  $5\frac{1}{2}$  per cent. In view of this uniformity we are entirely warranted in using the average values for the various groups and in basing conclusions upon them. These averages of equivalent evaporation per pound of dry coal are therefore assembled in Table III together with the averages of the rate of evaporation per square foot of heating surface per hour.

TABLE III—EQUIVALENT EVAPORATION PER POUND OF DRY COAL

Grade of coal	For the medium rate tests		For the high rate tests	
	Equivalent evaporation per lb. of dry coal, lb.	Equivalent evaporation per sq. ft. of heating surface, lb.	Equivalent evaporation per lb. of dry coal, lb.	Equivalent evaporation per sq. ft. of heating surface, lb.
3-in. by 6-in. egg..	10.21	6.78	9.09	12.42
Mine run .....	10.12	6.40	8.66	12.28
2-in. lump .....	9.95	6.82	8.32	12.46
2-in. by 3-in. nut..	9.90	6.72	9.11	12.39
2-in. screenings...	9.25	6.95	7.43	12.59
1 1/4-in. screenings.	8.47	7.07	7.06	12.61

In Table III the coals are arranged in the order of the evaporation at the medium rate as given there in column 2. For the high rate tests the nut coal gave the best performance, while the other grades stand in the order in which they are cited in the table. These relations stand out more clearly in Fig. 3 which has been prepared by plotting the values of equivalent evaporation and rate of evaporation given

in the table. In the figure the two points for each coal are connected by a straight line, which implies the assumption that the equivalent evaporation varies regularly and directly with the rate of evaporation. While there are, in this series, no tests at intermediate rates to support this assumption, it is amply warranted by the results of numerous other locomotive boiler tests.

Inspection of Fig. 3 reveals, as usual, for all grades a sharp decrease in evaporation as the rate of evaporation increases. The rate of this decrease is nearly alike for all grades except the 2-in. by 3-in. nut, for which it is roughly one-half of that for the other grades. This change in evaporation with rate of evaporation makes it necessary to reduce the values of evaporation to a common rate before drawing final comparisons between the various grades. To effect this reduction the rates of evaporation for the medium rate tests have been averaged and this average 6.70 lb. per sq. ft. of heating surface per hour—has been represented by the vertical line AA in Fig. 3. Similarly the average high rate—12.46 lb. per sq. ft. of heating surface per hour—is defined by the line BB. If we measure off the vertical distances on AA at the points where this line is intersected by the performance lines for the various grades we obtain six

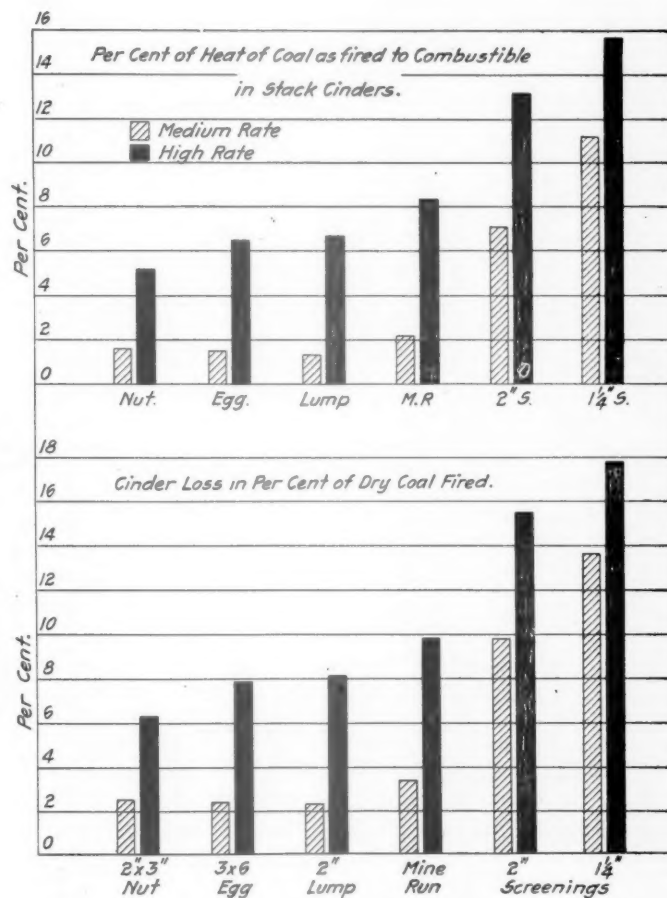


Fig. 4—The Cinder Losses

values of equivalent evaporation per pound of dry coal, one for each grade, which are rigidly comparable; in like manner the evaporation values defined by the intersections with the line BB are comparable.

At the medium rate the four larger grades gave nearly the same performance, the maximum difference among them being but four per cent. The steam production per pound of egg coal was two per cent greater than with the mine run, while with the lump and the nut it was respectively one per cent and two per cent less than with mine run. The performance with 2-in. screenings was seven per cent less

and with 1¼-in. screenings 15 per cent less than with mine run. If we assume that mine run coal on the tender is worth \$2 per ton the relative worth on the tender of the other grades during the medium rate tests was:

3-in. by 6-in. egg .....	\$2.04
2-in. lump .....	1.98
2-in. by 3-in. nut .....	1.96
2-in. screenings .....	1.86
1¼-in. screenings .....	1.70

At the high rate the 2-in. by 3-in. nut coal gave the best performance, producing six per cent more steam than the mine run; the 3-in. by 6-in. egg comes next with an evaporation 5 per cent more than that of the mine run; while the 2-in. lump evaporated three per cent less. At this rate of evaporation the 2-in. screenings and the 1¼-in. screenings produced per lb. respectively 13 per cent and 18 per cent less steam than the mine run. If we again assume that mine run is worth on the tender \$2 per ton, the relative worth of the other grades during the high rate tests was as follows:

2-in. by 3-in. nut.....	\$2.12
3-in. by 6-in. egg.....	2.10
2-in. lump .....	1.94
2-in. screenings .....	1.74
1¼-in. screenings .....	1.64

In considering the cinder losses as here presented it should be borne in mind that all of the coal tested was of one kind, that is, it came from one mine. Coals possessing other physical characteristics might show somewhat different results as to cinder losses under the conditions of the tests here considered. It should also be remembered that for a given rate, medium or high, the draft was, for all grades of coal, practically constant.

Fig. 4 shows the amount of the stack losses when the

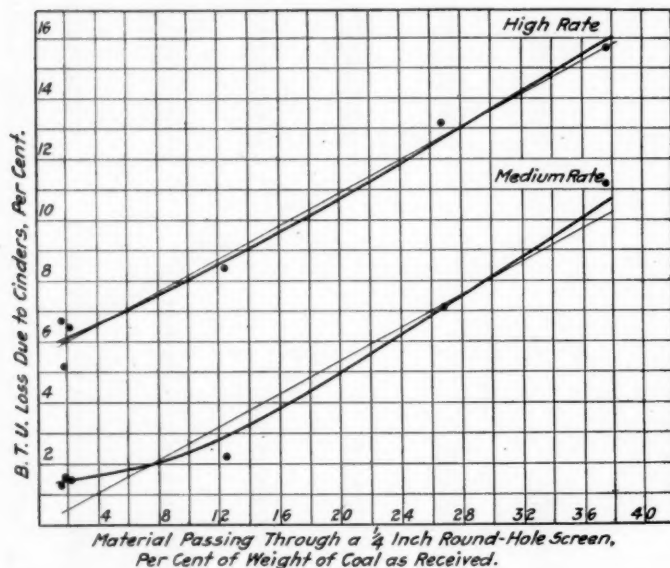


Fig. 5—Relation Between Cinder Loss and Fine Material in the Coal

weight of the cinders collected from the stack is expressed as a percentage of the weight of the dry coal fired, and also the amount of such loss when the heat content of the cinders collected from the stack is expressed as a percentage of the British thermal units in the coal fired. The loss when expressed as per cent of B. t. u. is numerically less than when expressed as per cent of weight of dry coal due to the fact that the cinders do not have as high a heat value per pound as the coal from which they originate. Also, due to the fact that cinders produced at high rates of combustion have higher heating values than cinders produced at low rates of combustion, the differences between percentages for medium rate and high rate tests are greater when expressed in terms of heat units than when expressed in terms of

dry coal. The average heating value of the stack cinders for all medium rate tests was 8,635 B. t. u. and the average value for all high rate tests was 10,854 B. t. u. The heating values of the cinders from the medium rate tests with screenings were higher than corresponding values from other grades of coal.

In Fig. 4 it will be seen that, during the medium rate tests, from two to 14.6 lb. of cinders were collected from the stack for each 100 lb. of dry coal fired; while for the high rate tests from 6.2 to 17.8 lb. were collected for each 100 lb. of coal. The screened coals in all cases produced fewer cinders than the mine run coal; and the screenings produced a materially greater quantity of cinders than any of the larger grades.

When the losses are expressed as B. t. u. percentages, the

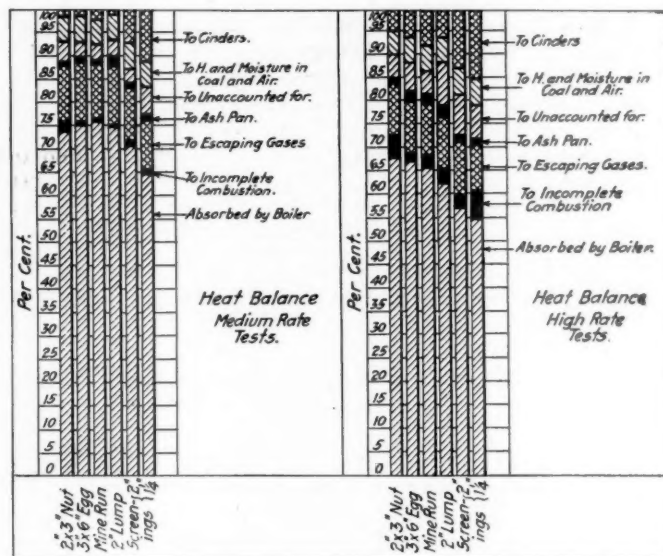


Fig. 6—The Distribution of Heat During the Medium and High Rate Tests

average loss from the screenings was roughly five times as great as the average loss from the larger coals during the medium rate tests. For the high rate tests the average loss from the screenings was more than twice as great as the average loss from the larger coals.

The data indicates that with very fine coals such as screenings the cinder loss is large even at medium rates of combustion and with comparatively low front-end draft; but that under these conditions the cinder loss is not serious for the larger coals even when they contain a considerable amount of fine material, as in mine run coal. For conditions involving high rates of combustion and strong drafts, however, the stack cinder loss is a serious one for all grades of coal.

Fig. 5 shows the relation existing between the loss due to stack cinders and the amount of ¼-in. or smaller material in the coal as received. The curves in addition to showing the relative magnitude of the cinder losses for the two rates of operation, show that the cinder losses increased quite uniformly with the increase of fine material in the coal. At the medium rate about one per cent of the coal would apparently be lost as cinders if there were no ¼-in. fine material at all in the coal; while at the higher rate and without such material, the loss would be about 5.5 per cent. The curve for the high rate tests shows an increase in the cinder loss of very nearly one per cent for each increase of 3.7 per cent in the amount of ¼-in. material in the coal. The light straight lines show for both rates, a uniform increase of one per cent in cinder loss for each 3.7 per cent increase in the ¼-in. material in the coal. The straight line

represents the plotted points of the high rate tests closely but does not so well represent the points plotted for the medium rate tests.

Fig. 6 presents average heat balances for the tests with each grade of coal for both medium and high rate tests. The figures have been so constructed that the groups are arranged with relation to decreasing values of the per cent of heat absorbed by the boiler during the high rate tests.

Generally speaking, the relations between the various elements of the heat balance for the different grades are nearly the same for the medium rate tests as for the high rate tests. All losses except those due to stack cinders are fairly constant for all grades of coal and the differences in the amount of heat absorbed by the boiler are accounted for, almost entirely by the variations in the losses due to stack cinders.

#### CONCLUSIONS

It was necessary to use one size exhaust nozzle during all tests, but probably different results on the nut coal at low rate would have been obtained with a larger nozzle. These and other tests we should like to have made had we had the funds and the authorization of the association.

Comparing mine run with 3-in. by 6-in. egg, we find the egg was 2 per cent better at the low rate and 5 per cent better at the high rate. The B. t. u. value of the egg was 2 per cent more than that of the mine run. This accounts for the difference at low rate and brings the high rate difference to 3 per cent; but when it is considered that the stack cinders were 2.2 per cent of the egg fired at low rate and 3.1 per cent of the mine run fired at low rate and 7.2 per cent of the egg fired at high rate and 9.0 per cent of the mine run fired at high rate, it is evident that the increased cinder loss of mine run coal over 3-in. by 6-in. egg is in part offset by the better combustion of the smaller particles of coal which exist in greater percentage in the mine run.

The higher standing of 2-in. by 3-in. nut than mine run at high rate is due to the lesser cinder loss and to the even and uniform condition in which it is possible to keep a fire using 2-in. by 3-in. nut. At the medium rate we believe the lower standing of the 2-in. by 3-in. nut in comparison with mine run was due to the necessity of carrying too thin a fire with the nut. At the low rate the 2-in. lump is one per cent below the mine run and three per cent at the high rate. At the low rate the 2-in. lump is 1 per cent below the mine run and 3 per cent below at the high rate. When firing 2-in. lump it was reduced to such size that about 74 per cent would pass through a 5-in. round opening, whereas all of the mine run as fired would pass through that size opening. The 2-in. lump was cracked to about the same size as it would be at a coal chute where the coal is cracked and passes through breaker bars spaced 5-in. in the clear. There were consequently not the large pieces in the mine run that there were in the lump and the committee concludes that cracking coal to the point where it will pass through a 5-in. round or 6-in. round opening is worth more than it costs. We do not necessarily mean hand cracking, for under many conditions mechanical crushing of the larger size coals will be found very profitable. Many roads prepare elaborate statements showing the cost of operating coal-ing stations and often as a result of these statements coal is not properly cracked. A coal needing much cracking, when sent to a chute having breaker bars causes the cost of chute operation to go up. The fuel distributor is then told to send this coal to a chute where there are no breaker bars and thus it is only slightly cracked.

Under ordinary circumstances mine run coal from this district can be purchased at from 15 cents to 25 cents less per ton than 2-in. lump, and 2-in. by 6-in. egg or 3-in. by 6-in. egg, and the egg and lump are often considered more economical and satisfactory than Mine Run. Where this

price differential exists, it would pay to increase supervision to the point where mine run can be handled as satisfactorily by all firemen as the lump and egg.

At the low rate the 2-in. screenings were 9.2 per cent better than the 1 $\frac{1}{4}$ -in. screenings, and at the high rate 5.2 per cent better than the 1 $\frac{1}{4}$ -in. screenings. At medium rate the cinder losses are not serious for the four hand-fired grades, but at high rate they are greater than is desirable. At both medium and high rates with the stoker fired grades these losses are very high though not enough to wipe out the ordinary price differential existing between the hand fired and stoker fired grades. This shows the importance of using on stoker engines as large screenings as the price differential will permit. Railway mechanical engineers, locomotive designers and builders, should give this matter serious consideration.

One of the problems which is beginning to confront railroads using stokers is what fuel efficiency will be obtained when using mine run hand fired in comparison with screening this mine run into 2-in. lump for hand fired engines and 2-in. screenings for stoker fired engines. Assuming that the mine run splits into 52 per cent of lump and 48 per cent of screenings, we find that using mine run as 100 per cent of the lump and screenings give 96 per cent of the efficiency of mine run at the low rate and 92 per cent at the high rate. This of course applies to both lump and mine run as cracked on these tests.

As a general conclusion addressed to engineers of tests and mechanical engineers we wish to recommend that all tests and data covering locomotive tests and boiler design be accompanied by a complete description of the character and size of the coal, also that when tests are being made care be taken to make sure that the coal fired is an average grade. In using mine run too much care cannot be taken to be sure that the normal percentage of all sizes of coal going to make up the mine run are contained in the coal tested.

The differences between mine run, 2-in. lump, 3-in. by 6-in. egg, and 2-in. by 3-in. nut are such that they could not have been determined by the ordinary road tests where only two or three round trips using each grade of coal would have been made, and the committee wishes to call attention to the fact that a very large number of road tests must be made to get a reliable average.

#### RECOMMENDATIONS

The Committee recommends:

That this report be placed in the hands of railway fuel men, engineers of tests, locomotive designers, and others who will be able to apply the data herein contained toward reducing operating costs on their lines.

That railways pay more attention to coal preparation and supervision of engineers and firemen with a view to securing better combustion.

That the tests on Franklin County, Illinois, coal be continued to cover: First; (a) 6-in. lump coal cracked to various sizes, (b) mine run coal cracked to various sizes, (c) 2-in. lump coal cracked to various sizes, (d) 6-in. egg run or screenings; Second; Tests at lower speed and higher drawbar pull.

That tests similar to those covered by this report and recommended above be made on coals from other districts, especially on coals having higher ash, higher and lower moisture and coking coals.

The report was signed by J. G. Crawford, chairman, H. B. Brown, W. P. Hawkins, O. P. Hood, L. R. Pyle, W. L. Robinson and E. C. Schmidt.

#### DISCUSSION

The influence of the mechanical make-up of coal on its evaporative value has not been known heretofore. Tests of this sort should result in economies by bringing about the use of the most economical grades of coal and the proper

sizing of coal for best results. Railroads are sometimes forced to use coal with a rather high percentage of slack on locomotives, and these tests show the probable loss under such conditions. While poor results are obtained from coal high in slack, it was reported that nut coal in some cases had been found unsatisfactory, owing to difficulty experienced in cleaning fires. It was urged that the tests at the locomotive laboratories be continued, testing coals of higher ash contents and coking coal.

## WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., July 10, 1917.

### PROPOSED WAR TAX ON RAILWAYS

Any railway officer who has not taken the pains to study the complicated provisions of the proposed war tax bill because of any notion that most railways have been immune from any approach to "excess profits" is due for a surprise when he comes to analyze the bill. The word "excess" is by no means synonymous with "excessive," the word "profits" requires some definition, and, in fact, most of the important terms used in the bill, such as capital, income and surplus, have very little relation to the commonly accepted significance of these terms, but are given arbitrary, artificial definitions which vary widely from the standard meanings.

While it is impossible to give any definite idea of what the proposed taxes will amount to, without a calculation for each road separately, figures that have been worked out tentatively for a number of roads indicate that if the bill should become a law some of the eastern roads that will receive increased revenue from the commission's decision in the 15 per cent case will have little of it left, after paying their taxes, to meet the other increased expenses which impelled the commission to allow an advance, while some other roads probably will have to pay much more in war taxes than the rate decision will give them.

The railways are affected by the income tax of 4 per cent, the excess profits tax and the 15 per cent tax on surplus, according to the provisions of the war revenue bill reported to the Senate last week. It was re-referred to the finance committee on Saturday for redrafting in order to raise enough additional revenue to enable the government to buy all the whiskey in the country at cost plus 10 per cent. The principal provisions of the war revenue bill as applied to railroads were briefly noted in last week's issue. A reading of the bill, however, gives little idea of its effect without actual figures, because of the peculiar meaning of the terms employed.

The new excess profits tax as proposed by the Senate Finance Committee applies to net income in excess of the average for the pre-war period of 1911, 1912 and 1913, or in excess of 6 per cent if the pre-war income was less than that amount. Net income as used in the bill means practically the net corporate income less dividend income. The capital on which the 6 per cent exemption is figured is defined as the fair average value of the assets actually invested, less the average amount of the liabilities and is practically the capital stock plus surplus. The proportion between excess profits and net income is to be determined by the Commissioner of Internal Revenue in accordance with regulations prescribed by him, with the approval of the Secretary of the Treasury.

If the average capital is greater or less than that during the pre-war period, allowance is made by deducting from the net income a proportionate amount. The rate of tax imposed on the excess is not a straight percentage of the excess but a graduated percentage, from 12 to 50 per cent, of the amount of the excess above the pre-war income or the 6 per cent exemption. The rates are 12 per cent on excess profits up to 15 per cent of the exemption, 16 per cent on the excess between 15 and 25 per cent, 25 per cent on excess between 25 and 50 per cent, and so on up to 50 per cent on any excess above 250 per cent.

The excess profits tax is in addition to the war income tax, which is increased from 2 to 4 per cent on the net income, which in this case means net corporate income less dividend income. There is also added a new tax of 15 per cent on the amount, remaining undistributed 60 days after the end of the year, of the total net income received during the year, less the amount used with the approval of the Interstate Commerce Commission or state or local authorities for extensions, renewals or betterments, and less the amount of other war taxes.

\* \* \*

The Senate on July 7 disagreed to the House amendments to the priority bill, which has been passed by both Houses of Congress, and Senators Newlands, Smith of South Carolina, and Cummins were appointed members of a conference committee on behalf of the Senate. The bill to increase the membership of and reorganize the Interstate Commerce Commission which has been passed by both the Senate and the House, is still in conference, where an effort will be made to reconcile the differences in the bills as passed by the two Houses.

\* \* \*

The appointment of Frank McManamy, chief inspector of locomotive boilers of the Interstate Commerce Commission, as a member of the commission has been recommended to President Wilson by Senators Hollis, Walsh, Husting and Ashurst.

## JURY BLAMES AUTO DRIVER FOR ACCIDENT

After a full investigation of a grade crossing accident which occurred on the Chicago, Rock Island & Pacific at Midlothian, Ill., on May 13, a Cook county coroner's jury recently rendered a verdict which holds the driver of the automobile wrecked in the accident to have been criminally careless to the degree of manslaughter. The jury also recommended that he be held to the grand jury on this charge until released by due process of law. This is one of the comparatively infrequent cases where a railroad is involved in which the blame for an accident has been placed solely upon the other party. The accident occurred about 4:45 p. m. on May 13, at Midlothian, Ill., a station about 23 miles southwest of Chicago, when a Rock Island passenger train, running between 50 and 60 miles an hour, eastbound, struck a Studebaker 7-passenger automobile owned and driven by Guy A. Ferree. Ferree was a real estate salesman, and had in his car six people, five of whom he was taking to some property near Midlothian. These six people were killed almost instantly, while Ferree, the driver of the car, survived, and is now convalescent. The grade crossing was in good condition. Two main tracks and a side track cross the street, and the Midlothian station of the Rock Island is located close by. Two other sidings are located between 80 and 100 ft. west of the main line tracks. The view from the road in the direction from which the train approached is clear and unobstructed, and a train would be in full view when within one-half or three-quarters of a mile from the crossing at any time when an automobile might be within several hundred feet of the tracks.

An inquest was held by a deputy coroner of Cook county at Blue Island, Ill., on June 23 and June 29. After the testimony was taken the jury went to the scene of the accident and viewed the crossing and surroundings. After deliberation the coroner's jury returned the verdict mentioned above. The driver of the machine testified that he did not stop, that he did look, but did not see anything. Outside witnesses testified that they heard the whistle of the train even before they could see the train itself. Had Ferree stopped his machine and looked, at any point within 80 or 100 ft. of where the automobile was struck, the accident might have been avoided.

# Heavier Car Loading Is Winning Out

Methods Used by the Pennsylvania Railroad Which Are Proving Successful. Canadian Pacific's Good Work

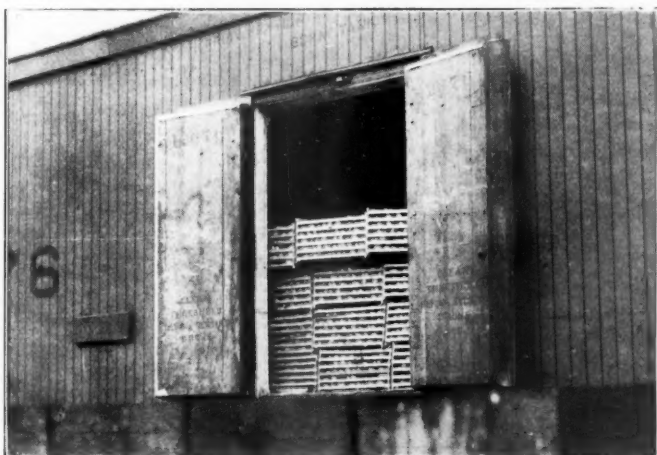
THE *Railway Age Gazette* will print from time to time accounts of methods which are being pursued to obtain better car loading together with a summary of some of the results being obtained. The following articles describe methods used on roads that are meeting with encouraging results.

## MAKE ONE CAR DO THE WORK OF TWO

By H. C. Bixler,

Superintendent Stations and Transfers, Pennsylvania Railroad

"Make one car do the work of two" is the slogan that the Pennsylvania is trying to drive home to every shipper and consignee, every broker and buyer, every farmer's grange,



Car with Only Half a Load of Crates of Onions

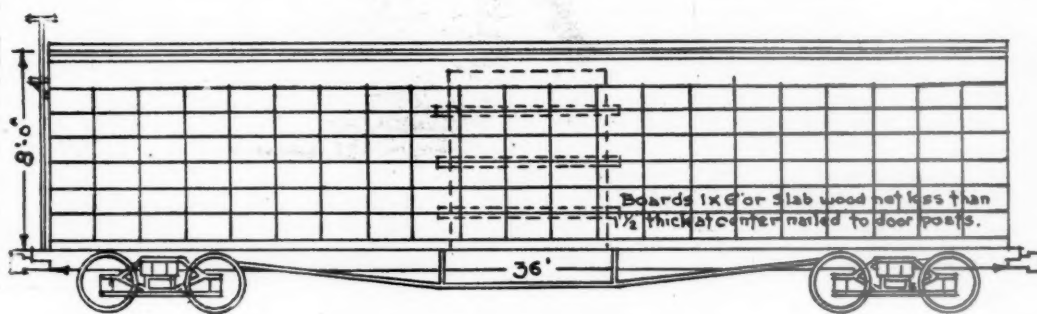
manufacturer's association, board of trade and chamber of commerce on its lines. It is the big gun in the battery and represents, we believe, the solution of the car shortage prob-

lems upon the full capacity of the car which is 10 per cent above the marked capacity; by loading cars as soon as they are placed and not taking advantage of the 48 hours' free time allowed under the car demurrage rules; by giving the agent billing instructions in advance so that the car can be moved as soon as it is loaded.

Consignees can help: By increasing the size of their orders for goods to the carrying or cubic capacity of cars instead of ordering goods on the minimum carload basis, which in many instances is only half a carload; by arranging in advance for men and teams to unload cars as soon as placed and not take advantage of the 48 hours' free time allowed under the car demurrage rules; by avoiding use of cars for storage purposes; by instructing their teamsters to finish the unloading of a car at the end of the day when only a small portion of the load remains in the car.

On the Pennsylvania Railroad system the average loaded freight car moves with about half its carrying capacity utilized. What this means may be judged from the fact that on the Pennsylvania alone the unutilized car space is equivalent to the carrying capacity of 120,000 freight cars.

It is realized, of course, that it is not possible now, and probably never will be, to have every freight car move at all times with a full load. That would represent an ideal condition. Nevertheless, we should endeavor, as far as possible, to make 100 per cent capacity our goal in an effort to make every freight car do all the work possible. On the Pennsylvania we have been actively engaged in this campaign for little over a year. We found many difficulties to overcome, both in regard to commercial practices and railroad operation, but feel that we can point to actual and substantial results. Taking our lines east of Pittsburgh and Erie for comparison and using the latest figures available, namely, those for April, 1917, we find that the average load per freight car has been increased nearly three tons as compared with the corresponding month of the year previous. This means a saving of more than 58,000 cars in a month. Measured in value per car to the railroad this



Car Loaded with 1,000 Crates of Onions. Weight, 54,000 lb.



lem. We are doing this as a portion of our share of the work which has been undertaken by all the railroads of the country to raise their operations to the highest practical degree of efficiency, in order that they may in that way render the maximum service to the government in the conduct of the war.

There are a number of ways in which it is conceivable that more work can be gotten out of a freight car.

Shippers can help: By ordering only such cars as are needed for immediate loading; by basing their orders for

would mean a large saving, but measured in car value to shipper and to the country as a whole, a far larger saving has been achieved.

We feel that we have "broken the ice," so to speak, in this work, and our headway this year should be at a more rapid rate, which will be of correspondingly increased benefit to the government, to the shipping public and to the railroad.

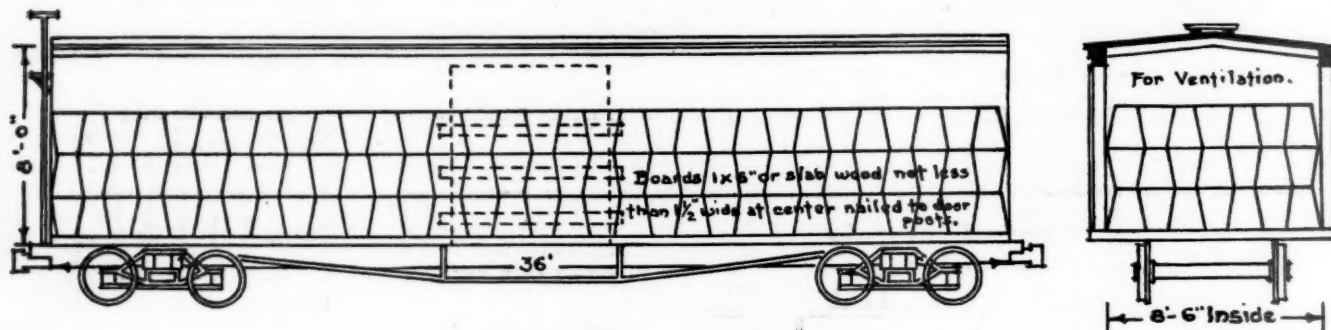
It is impossible to make any material progress in the way of increased car efficiency without the full and complete co-

operation of the shipper and consignee, but we cannot expect to have this unless they fully understand the practicability of what we are trying to do.

We have carried on the work chiefly through station agents, furnishing them with material in the series of car utility bulletins, of which six have thus far been issued. The first four bulletins paved the way for our bulletin No. 5 which was prepared in diagram form and with the thought of bringing directly to the attention of the shipper, the extreme waste of car space which results when the trade unit

carrying capacity. Our car utility bulletins have dealt very largely with this subject by pointing out specific instances. Cotton is shipped in 50 bale lots, weighing 25,000 lb., although a car will hold 108 bales, weighing 54,000 lb. In the building trade it is customary to order bricks in 10,000 lots, which is less than half a carload; tomatoes are commonly shipped in units of 550 cases, which weigh about 37,000 lb., while a car will carry 1,500 cases.

The usual shipment of fertilizer, 250 bags, weigh 42,000 lb. The car could be loaded with 600 bags, weighing 100,-



**Hampers Loaded to Brace Each Other**

672 Hampers of Cucumbers (Size 20 in. by 16 in. by 10 in.) Approximate Weight 27,000 lb.

is the governing factor. In this bulletin we could show through these diagrams plainer than in any words that could be written, the space occupied in car by certain commodities when shipped in trade or selling units. Alongside of the present method of loading we were able to show a plan of a car holding twice, and in some cases, almost three times as much freight as was formerly the practice to load. Bulletin No. 6 closely followed No. 5 and covered the loading of fruits and vegetables. We were able to show in this bulletin by means of diagrams and photographs that increased car-loading not only helped to eliminate car shortage but permitted of better stowing and subsequent better condition of

000 lb. A full carload of sugar, in bags, would contain 1,000 bags, weighing 102,000 lb., whereas a car usually consists of only 400 bags, weighing 40,800 lb. Sugar in barrels is ordinarily shipped 100 barrels to the car, while 244 barrels could be placed in the car, and the weight increased from 37,280 to 90,960 lb. In a similar way, the commercial unit in shipping salt is 536 bags, weighing 53,600 lb. A box car will hold 1,100 bags of salt, weighing 110,000 lb. Oil is usually shipped 65 barrels to a car, the weight being



**Not Enough Hampers Put Into the Car to Properly Brace Each Other**

perishable freight upon arrival at the market. These diagrams brought out in pictures what we had been trying for months to portray in words: the unreasonable waste of car space. Some of the photographs and diagrams are here printed. After the agents understand what we are endeavoring to accomplish, it is not a very difficult matter for them to pass the information on to patrons with whom they come in contact.

One of the greatest problems which confronts us today lies in the trade customs in the various lines under which commodities are shipped in commercial units of so many sacks, bags, and barrels, which, instead of filling or approximately filling the car, take up only about half of the cubical or



**Damage Resulting from Only Partly Loading a Car**

26,650 lb. There is no reason why 148 barrels of oil, weighing 60,680 lb., could not be shipped in a car.

One of the most encouraging developments we have noticed is the disposition on the part of a number of shippers, some of them very large ones, to get into the campaign themselves, and to individually urge better car loading as a means of increasing their own business.

The Universal Portland Cement Company of Pittsburgh, Pa., and the Alpha Portland Cement Company of Easton, Pa., are showing very remarkable results in increased car loading of cement. The Carnegie Steel Company, the American Sheet & Tin Plate Company, and the National

Tube Company of Pittsburgh, Pa., have inaugurated a systematic method for intense loading, and they have succeeded in utilizing almost the entire car capacity.

The Washburn-Crosby flour mills are conducting a lively campaign for better loading by issuing educational circulars. The Barrett Manufacturing Company at Philadelphia has increased its average loading per car three tons since the first of the year, and has set up as a standard 23 tons to be obtained by September 1.

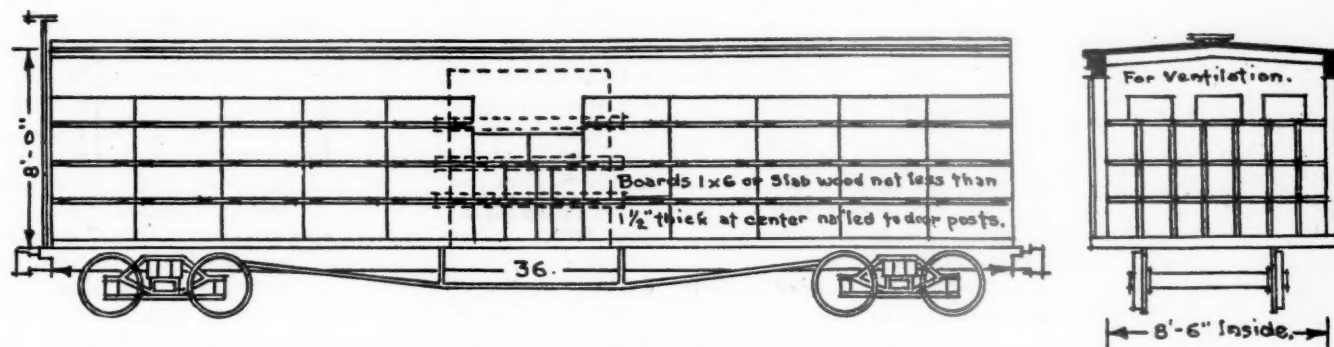
We are especially glad to notice that the fertilizer trade is taking up similar work and carrying it on in earnest, with the aid of the American Fertilizer Magazine. Willet & Gray's Statistical Trade Journal has given its support to

patriotic impulses have been stirred, and a general appreciation aroused as to the urgent need for making the greatest possible use of freight car facilities.

#### CANADIAN PACIFIC METHODS

The operating department of the Canadian Pacific has given the problem of increasing the average load per car constant attention for a number of years. During this time various methods have been developed in bringing about the desired improvement in the freight handling performance of the equipment which are of general interest to railway men.

While on certain portions of the line large quantities of



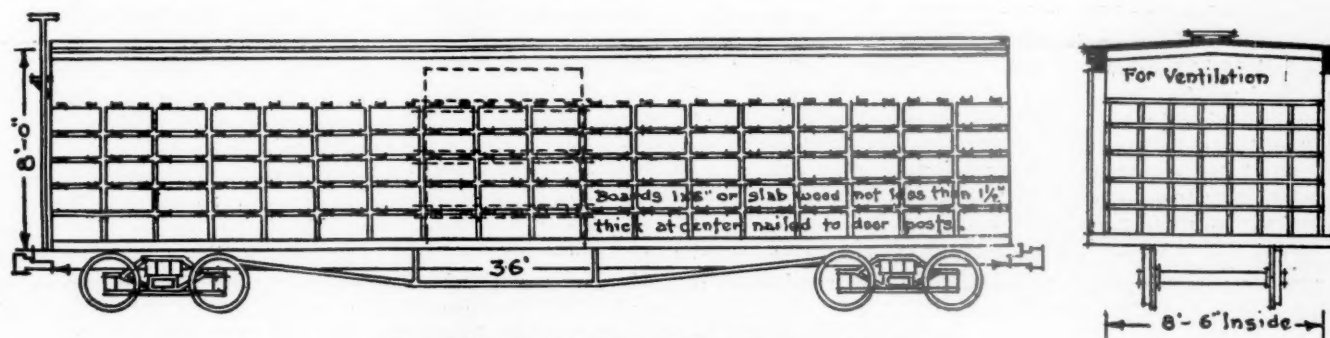
Car Loaded with 256 Crates of Cabbages, Weighing 51,200 lb.

Strips are Nailed to Ends to Give Ventilation

the Pennsylvania Railroad's campaign for heavier loading by reprinting diagrams covering the loading of sugar. The Canner Magazine of Chicago has also taken up the cudgels in the interests of freight car efficiency. Special mention is due to the Railway Business Association for its vigorous campaign covering the entire country. It was a great patriotic act when President George A. Post volunteered to put the powerful machinery of the Railway Business Association behind the full loading of cars.

Lately we have been trying the effect of competition as a means of stimulating better car loading. This has been done in several ways, one being by tabulating each month of

heavy commodities, such as grain, coal and ore are transported, there is also a great volume of manufactured articles, forest products and similar freight cars which cannot be loaded to anything like the weight handling capacity of the cars. It was found on investigation that with shipments of a heavy nature it was customary for shippers and consignees to handle their goods in lots of certain designated sizes without regard to the capacity of the car. Many flour millers, for instance, when calling for wheat ordered a "carload" of 1000 bushels, equal to about 60,000 lb.; purchasers of cement, flour, sugar and similar goods likewise placed orders based on the minimum weights prescribed by tariff or so ordered



Carefully Loaded Car with 630 Crates of Tomatoes

Strips of Not Less Than 1 in. in Thickness Nailed to Both Ends of the Crates Extending from Side to Side are Required to Give Proper Ventilation

the result obtained by every division, thus reflecting the energy with which the station agents and various sections of the railroad are conducting their work. In a similar way we have called to the attention of shippers the relative conditions as to car loading, and we have noticed a gratifying desire on the part of many of our patrons to be leaders in this work of aiding transportation efficiency. This is made possible through a system of reports, whereby each agent is required to furnish the general office with all the data concerning the loading from his station.

Such rivalry, both within and without the railroad organization, cannot fail to have important results, as it shows that

sometimes for no other reason than that they had always secured their freight in that manner. The resulting light loading and waste of equipment has had no small part in the creation of car shortages during seasons of heavy traffic, and also, has, to a certain extent, been responsible for the congestion at such times by forcing into delivery points a greater number of cars than were absolutely needed to move the traffic offering for the various destinations, besides causing the expenditure of engine and man power in moving a large percentage of tare weight that should have been devoted to the handling of actual freight.

The situation naturally received more attention than ever

when, a few months after the beginning of the war, the railway was called upon to move immense quantities of munitions to the seaboard for transportation overseas, to carry thousands of carloads of raw materials to munitions plants and, at the same time, to transport the regular business of the country. Facilities were taxed to the utmost and the time soon arrived when the thousands of cars which had been idle during the season of depression immediately preceding, were all in service, and the demands of the shippers were far from being met. It was impossible to secure more cars, and, in fact, the company had, and still has considerably less than its rightful quota of equipment, owing to congestions existing on other lines, which condition has resulted in serious delay in returning cars to the owners. The obvious method to adopt in relieving the shortage was to load more freight in the same number of cars, and it was plain that there was unlimited room for improvement in that direction. The first step was to ensure capacity loading of all company material, and it was seen to that the existing instructions on this point were strictly observed.

Tests had been made some time previous in connection with the carrying capacity of cars, and it was found that while a 30-ton car might not, with safety, be loaded to more than 33 tons, cars of 40 and 50 tons capacity might be given considerably in excess of the usual 10 per cent over stencilled capacity. It was arranged that 40-ton box cars were to be loaded to 94,000 lb. and certain series of 50-ton open cars to as high as 125,000 lb. Connecting roads were then approached with the suggestion that they permit similar loading of their equipment, or, if they were unwilling to do this, to allow Canadian Pacific cars to be so loaded for passage over their respective lines that benefit might be obtained from the increased load per car in the movement of through as well as local traffic. Various replies were received, but a number of the railways addressed signified their approval of the proposition, and have adopted the practice.

The Canadian Pacific handles an immense volume of grain from terminal elevators in Western Canada, both for export via Atlantic seaports and to flour mills in the east. The effect of the increased capacity of 40-ton box cars in supplying equipment for the movement of this grain has been most marked, and a striking example of this is found in the following:

Between May 1 and December 31, 1916, there were loaded in 40-ton cars from the Canadian Pacific elevator at Port McNicoll 17,769,391 bu. of wheat for export via Montreal, Que., and via St. John, N. B. Up to about the middle of November this wheat was taken to Montreal, a distance of 358.8 miles, and from then until the close of the year to West St. John, a distance of 836.6 miles. The wheat was loaded in 11,366 cars, so that the average load carried was 93,803 lb. or 1,563 bu. The increase in the average load per car beyond 10 per cent in excess of the stencilled capacity authorized by M. C. B. rules, of 5,803 lb. resulted in a saving of 750 cars, and the haulage of dead tare to the extent of approximately 11,932,502 ton miles. It might be added that in the movement of the above large number of cars, and, in fact, in no case on record, did an accident occur that might be attributed to the loading of the equipment in excess of the usual 10 per cent over marked capacity. During the winter just past, a very large quantity of grain has been moved from Fort William and interior points in the west, as well as from Port McNicoll, and the conservation of motive power, cars and labor that has been achieved by insisting on capacity loading is most encouraging.

The handling of grain as above described, however, particularly in the case of export shipments, is something over which the railroad exercises more or less complete control. Some difficulty has been experienced in prevailing upon shippers to load heavily, as in many cases their expense of loading would be increased, and the shortage of labor made

it hard for them to secure men who would undertake the more severe work of loading, say, a car of flour to the roof. In many instances the smaller consignees did not care; or were unable to invest sufficient money to purchase a full carload of goods, preferring to order only sufficient to conform to the weight published in the tariffs. In other cases it was found that loading regulations promulgated by departments of the Government having charge of the handling of munitions prevented shippers from fully using the cars placed at their disposal, even if they were so inclined. These and many similar conditions tended to discount the efforts that were being made by the railways to preserve economy in freight transportation, and it was evident that before the end sought could be obtained it would be necessary to secure the whole-hearted co-operation of the public.

In seeking some striking manner in which heavy loading and its attendant benefits might be placed before the shippers, consignees, trade organizations and others concerned, it was decided to issue in graphic form some figures showing exactly what might be done by the public itself, somewhat similar to a circular issued to employees of the Canadian Pacific in 1914 by Alfred Price, assistant general manager. Figures were drawn from the government statistics indicating that by increasing the average carload by 5 tons during 1917, as compared with the record of 1915, it would be equivalent to placing many thousand additional cars in service. Copies of this circular were mailed to all boards of trade and trade journals, numbers were sent to representatives of the company throughout the country, copies were furnished to connecting roads, a copy was mailed to each shipper and consignee writing to the railway about his freight, and every other opportunity of placing the matter before the public was seized as it presented itself. The response on the part of a large number of the company's patrons was immediate, and not only did they give assurance of their intention to co-operate but issued circular letters on their own account to their customers, impressing upon them the importance of "ordering a carload." Many applications were received for additional copies of the circular, one large shipper calling for 2,500 which were distributed to all concerns having dealings with that company.

Of this circular, or "Bulletin No. 1" 30,000 copies have been distributed. "Bulletin No. 2," which is of a follow-up nature, is now ready for distribution. The third circular is in course of preparation, and it is the intention to issue a series of notices of this kind until it is felt that the subject has been thoroughly advertised. In addition to the bulletins, a printed notice has been prepared which will be in the nature of a particular appeal to consignees, and a small sticker is used for attachment to replies to communications having to do with the supplying of cars and similar matters, this sticker bearing the words, printed in red ink, "Reduce car shortage by filling cars."

The systematic checking of freight waybills and weighing reports is being gone into more vigorously than ever, and where it is found that cars are being lightly loaded, the shipper and consignee are either visited or communicated with by letter, and the suggestion made that they can "do their bit" in helping to cope with the present trying situation by exercising economy in the use of freight cars.

At some of the larger centres inspectors have been placed and these men look over cars as they are opened so that data may be obtained that will enable the railway to get in touch with shippers of light-weight goods who, while they cannot load a car to its full weight-carrying capacity, may be able to use the entire cubic capacity. This has also brought about some good results particularly in the case of such commodities as pulpwood (of which a great quantity is handled in Eastern Ontario, Quebec and New Brunswick) lumber, packing-house products, etc. As the result of an interview with one packing concern, a shipment for which 10 refrigera-

tor cars were about to be used, was placed in 7, and the haulage of 3 cars for a round trip of over 5,000 miles saved. In another instance, a flour milling company, having received an order calling for 16 cars, got in touch with the consignee and was able to arrange for the consignment to be loaded in 10 cars.

In certain localities where a great deal of loading takes place committees have been appointed for the purpose of visiting shippers and soliciting their co-operation, and good results are being obtained from that source. At meetings between the public and representatives of the railway "loading of cars" is invariably introduced, and as opportunity presents itself it is the intention to call meetings of the larger dealers, and tell them at first hand what they can do in the way of assisting the railways to give them better service.

Government bodies such as the Department of Overseas Transport and the Imperial Munitions Board have been approached and asked to lend their assistance in the prosecution of the campaign, and the help received from that direction is most encouraging. Controlling as they do the manner in which goods shipped on their orders shall be loaded, these organizations have been able to issue instructions and to amend orders previously placed so as to ensure capacity loading in a large majority of cases.

In looking over the results of the efforts made thus far we find that during the month of February, 1917, the average weight of carload of export freight moved to West St. John was nearly five tons heavier than was the case a year ago, this increase being equivalent to one more trainload of freight per day in the same number of cars. On another portion of the line where a great deal of light-weight freight is moved, there was an increase of 20.1 per cent in the average load per car during March, 1917, as compared with March, 1916, and that during the same month nearly every division of the railway in Eastern Canada shows a gratifying improvement as against the record of a year ago. The average freight tons per loaded car mile for the entire line east of Port Arthur in March, 1917, eastbound, was 28.6, an increase of 8.3 per cent over the same month for the previous year, and westbound, an increase of 8.8 per cent. Perusal of the current records for April leads to the conclusion that the performance for that month, as shown in the summarized statistics (which have not yet been issued), will far out-strip that of March, and it is felt that as the movement to "increase the load and decrease car shortage" gathers momentum, the result will be far beyond anything that was considered possible a few months ago.

#### LOADING COMPETITION ON SOUTHERN PACIFIC

Prizes will be awarded to agents on the Southern Pacific, Pacific system, whose stations show the best records for car loading between July 1 and December 31. Only agents at stations handling at least 40 carloads of revenue freight outbound during the period will be eligible for the competition. Awards will be made on the basis of the greatest improvement shown in the loading of 18 separate commodities—number 18 being l.c.l. freight—over the previous records made at the same stations between September 1, 1914, and June 30, 1915, when a similar competition took place. For each commodity a first prize of \$50 and a second prize of \$25 will be awarded, but no station will be considered in the award of first prizes unless at least 10 cars of the commodity under consideration have been loaded at that station during the period. A station loading as many as five such cars will be eligible for second prizes. A separate competition with a first prize of \$50 and a second prize of \$25 for loading l.c.l. merchandise has been arranged for the following cities only: San Francisco, Cal., San Pedro, Los Angeles, Stockton, Oakland, Sacramento, Fresno, San Jose and Portland, Ore. These cities are not eligible for first or second prize for l.c.l. loading

in the general competition. In addition, a prize of \$15 for each commodity will be awarded each month to the station making the greatest improvement for that period when compared with the average per cent of load to car capacity obtained at the station during the 10 months ended June 30, 1915.

#### FURLOUGHS FOR PENNSYLVANIA EMPLOYEES WITH THE COLORS

Any employee of the Pennsylvania Railroad who responds to the call to arms is granted a furlough by the company for such time as he may be engaged in state or national military or naval service. He is also allowed to retain the same privileges of free transportation to which he was entitled when engaged in the active service of the railroad. Credit will also be given, in computing pension allowances, for such time as the men are engaged in this service. This announcement is given in a general notice to all employees issued on June 27 by General Manager Elisha Lee. The notice follows:

"The board of directors of the Pennsylvania Railroad has taken formal action providing for the retention in the service of any employee of the company for such time as he may be engaged in state or national military or naval service in response to a call to arms in the event of war or other emergency. This applies whether they may be members of the National Guard or not.

"Heretofore the rule of the company has been that a furlough from active service could not be granted for a period longer than nine months. At the time of the Spanish-American war, employees who engaged in military or naval service sacrificed their positions, as the period of enlistment exceeded their furlough, although following the war every effort was made to find places for the men who had left on that account.

"Under the plan now adopted, employees shall be granted a furlough during the time they may be engaged in such military or naval service, and credit for the time absent will be given in computing pension allowances of employees so furloughed.

"Furloughed employees while engaged in military or naval service will be entitled to the privileges of free transportation the same as when engaged in active service of the company.

"The advisory committee of the Voluntary Relief Department also took action on this resolution, and the effect will be that during the continuance of such furlough by the company, a member engaged in military or naval service may continue his membership in the Relief Fund, and, if he keeps up his contributions, will be entitled to the benefits of the fund provided for any member who is on furlough. In cases of disability, in order to be entitled to Relief Fund benefits, employees will be required to advise cause of disability, furnishing name and address of military officer giving medical attention, and have company commander furnish memorandum showing number of days off active duty because of such disability.

"The company is sincerely interested in the welfare of its employees engaged in military or naval service, and has established a special bureau in charge of G. W. Buzby, special agent, with office in room 628 Commercial Trust building, Philadelphia, Pa., to look after their interests. The duties of this bureau will be to keep in communication with such furloughed employees either by personal visits or correspondence, and to act as a medium for the exchange of information between them and their families and friends at home; and to render any assistance consistent with the object of the bureau and the requirements of the men. Furloughed employees are requested to keep this bureau advised of their military addresses."

## DENVER & RIO GRANDE SUFFERS HEAVY DAMAGE FROM FLOOD

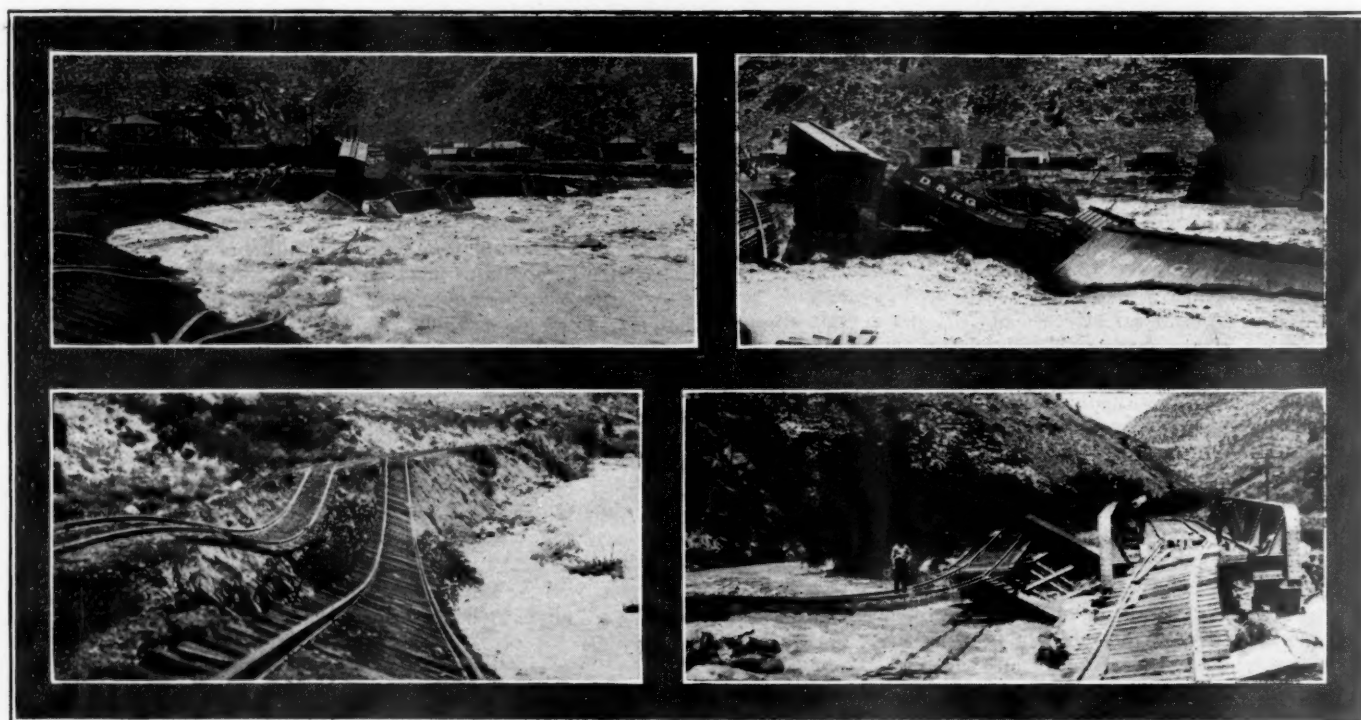
The recent failure of the Gooseberry creek dam which serves to impound water for irrigation purposes in the vicinity of Price, Utah, resulted in heavy damages to Denver & Rio Grande property and the suspension of traffic between Denver, Colo., and Salt Lake City, Utah, for several days. Those portions of the road affected were the double-track main line which parallels the Price river through a canyon from Helper, Utah, to Colton, a distance of 18 miles, and a branch line running 21 miles south from Colton to serve the coal mines located at Scofield and at Clear Creek. The line of this branch follows in general a tributary of the Price river.

The Gooseberry reservoir is situated on Gooseberry creek, the tributary of Fish creek which, in turn, flows into the Price river. On the afternoon of June 24 telegraphic advice of the failure of the dam was received by D. & R. G. officers. The water courses which generally parallel the

ft. to 750 ft. in length. While this stretch of road is not generally high above the elevation of the normal flow of the Price river, sections of the roadbed, 30 ft. or more in height, were washed out at several places.

A bridge leading to the Panther mine and one on the tracks serving the Spring Canyon Coal Company and the mines of the Standard Coal Company were washed out. The Utah Fuel Company also suffered serious damage, but by dynamiting one of the railroad bridges and using rails to protect the banks, the large tippie used by the company escaped with comparatively light damage. The flood also washed away eight residences and two business houses at Castle Gate, three dwellings at Carbon, a mining camp about two miles to the east of Castle Gate, and five dwellings at Helper.

The Gooseberry dam impounded 11,000 acre feet of water or virtually 17 square miles of water a foot deep. The heavy snows of the past winter did not begin to melt until the arrival of hot weather, which came about six weeks later than usual without the warm spring days which usually pre-



Yard Destroyed at Castle Gate, Utah  
One of 14 Washouts, 350 to 750 ft. in Length

Another View at Castle Gate Where Seven Cars Were Washed Into River  
One of the Bridges Destroyed

### Flood Views on Denver & Rio Grande

railroad were not affected until Monday, June 25. At this time the water began to rise rapidly and on the evening of June 25, reached the highest stage at Castle Gate, Utah. About five miles of the Scofield branch was almost completely destroyed so that practically entire reconstruction will be necessary. At numerous points in the Price river canyon between Colton and Helper the roadbed, although very largely of rock construction, was destroyed and two bridges consisting of double-track steel girders on concrete masonry substructures were washed away with practically complete destruction of abutments. Besides these bridges, several others were either destroyed or damaged so badly that heavy repairs were necessary. The greatest amount of damage was concentrated at Castle Gate, where the canyon is particularly narrow. At this point several sidetracks, both main tracks, the depot, a water tank and several cars were destroyed, the station building being completely obliterated. There were 14 washouts on the main line ranging from 350

feet to 750 feet in length. As a result, the water from the snows was unusually great and came all at once. Exactly what caused the dam to give way has not been definitely determined, but a semi-official report of the state engineer states that the temporary spill-way was inadequate to handle so large a volume of water. When it was reported that the dam was breaking, the residents of the towns along the Price river at once moved to nearby mountain sides with their household goods and stock. When the water did come, there was little left in most of the towns except the empty houses. Only one life was lost. After passing Helper, the flood spread into a broader valley and the damage to property was much lighter than in the canyon.

By constructing shoo-fly tracks in some places, swinging the good track over toward the mountainside in other places, and cribbing where both main tracks were down, a single track line was opened for through traffic between Denver and Salt Lake on July 4.

# Increasing the Tonnage of Freight Trains

## The More Important Principles Emphasized in Six of the Discussions Received in the Contest on This Subject

THE two prize winning papers received in the contest on the subject of Increasing the Train Load, and two other papers were published in the issue of June 22. Six other papers which were received in this contest are included in this article. While the subject of securing full train loading has received very close attention on individual roads during recent years it has never been given as widespread attention on all roads as at present when the demand for the full utilization of all railway facilities is so pressing.

### A TONNAGE BUREAU

By M. E. Burke.

Norfolk & Western, Roanoke, Va.

Operating officers have their hands full with the routine duties of operation and with continuous demands to furnish information of various kinds to the different legislative bodies. As a result they have not the time necessary to deal intelligently with this important problem. Every railroad of any considerable size, therefore, should establish a special bureau to deal with the question of train loading.

The field of this bureau is very broad, yet very definite. It can be outlined in this way:

A. To determine the most economical maximum tonnage ratings for each class of locomotives in the different services on each district of the system.

B. To replace gradually the old method of tonnage rating by the new—that of rating according to train resistance or drawbar pull.

C. To ascertain the most economical combination of power to be used in each class of service where more than one locomotive per train is used.

D. To see that each terminal where trains are being made up is furnished with sufficient information in ample time to avoid, when possible, the use of light power in both directions.

E. To be sure that the yard offices are guided by the official ratings and are computing the train tonnage correctly.

The first step in determining economical tonnage ratings does not call for the use of a dynamometer car. I have found it very profitable when entering a new field to make a complete list of all the tonnage ratings existing on the system; to determine the ratio of the tonnage ratings of the different types of locomotives in the same class of service on each district of the system; and to determine the ratio of the tonnage ratings of the same type of locomotives in different classes of service on each district of the system. Such information very often surprised the local officials. In cases where similar classes of locomotives were used on several districts, a variation of from 40 to 50 per cent in the ratio of the ratings would not be uncommon. The following table illustrates the point:

	A	B	C	D	
(1)	100%	95%	80%	60%	Classes A, B, C and D are different types of locomotives—all in one class of service. Lines 1, 2, 3 and 4 refer to different districts of the system. Class A is taken as the basis of comparison, or 100 per cent. The relation of the remaining three classes of locomotives to A shows the inconsistency of our present ratings.
(2)	100	55	85	70	
(3)	100	70	75	55	
(4)	100	98	82	59	

Similar results were obtained by tabulating the different percentages of cuts allowed for time freight trains as compared with corresponding slow freights on different districts of the system, special attention being given to the speed re-

quired in each case. Here, too, a surprising variation was detected.

The local officials, having been furnished with this information, have taken the matter up with their trainmasters and chief dispatchers and gradually raised the ratings that fell below the average ratio. Uniformity and gain in ratings were thus obtained over the system. These were very profitable, for in all cases ratings were raised and never lowered.

The next step in getting at the most economical maximum ratings is to go over old train performance sheets for a period of time, pick out those trains with the highest total tonnage hauled and analyze the time made by them in getting over the line. The trains with both average performance and economical time on the road will indicate whether or not the official tonnage ratings are high enough. These steps usually bring the ratings up considerably, even if not to the highest point of economical practice.

Great judgment must be exercised in carrying on this work. It must always be remembered that the road and power conditions are not the most trying features to be considered. The greatest opposition, if any, to be met is that of the men. Human nature, as a rule, opposes anything new. This is especially true in dealing with organized labor. The most important qualifications of the man in charge of the bureau under consideration are those of being a good mixer, of being capable of stirring up enthusiasm in every one connected with the handling of trains, and of cultivating an atmosphere of co-operation instead of an attitude of checker and checked.

Thus all concerned will become accustomed to the term tonnage rating and will be interested in making as good a showing as any other division on the system. The idea of new tonnage tests is no longer foreign. The time is ripe to introduce the latest scientific way of rating trains—that of substituting the resistance of the train for its total actual tonnage. All operating men know that trains with the same total tonnage but with different numbers of cars are not handled with the same ease. They all agree that a train with 50 forty-ton cars is harder to get over the road than a train with 40 fifty-ton cars, all other conditions being equal. To overcome this difficulty the factor of resistance must be introduced on each district in connection with its most economical rating. This factor should be determined by a series of tests with the proper combinations of cars. It should take into consideration the average weight of the cars handled on the district, the controlling grades and their length, position and frequency.

Some roads use the train resistance computer for this purpose, but I am inclined to think that its mechanism is too susceptible of mistakes by the yard clerks. It requires very careful manipulation and even then very often gets out of adjustment. One of the large roads, I believe, is following the method of inserting the average factor of resistance on each table of ratings in both directions for each district on the system. These tables are usually compiled in pamphlets, each pamphlet containing the ratings for one division and the general instructions being given on the first page.

The third phase of the work—that of providing the most economical combination of power to be used in each class of service where more than one locomotive per train is used—is one of the most difficult tasks of the bureau. It requires a thorough knowledge of the physical and climatic conditions of the road and also of the nature of the freight handled. Frequently no iron-clad rule can be applied to any terminal

to be followed in making up trains. The local people must be made to appreciate the absolute necessity of watching and weighing the situation in hand continually. While it is profitable, as a general rule, to haul trains with rated tonnage, it would be quite uneconomical to follow this when it becomes necessary to equalize power. Double-heading trains all the way, using helpers part of the way, pushers over controlling grades, and turn-backs are some of the methods that may be used in solving these problems. Very much can be said pro and con regarding each of these methods, but their merit depends largely upon the local conditions.

In connection with this part of the work it would perhaps be of some value to outline a general policy as a guide for such a bureau in its endeavor to fix economical combinations of power for the most efficient handling of trains. Our railroads are being subdivided continually into new divisions and districts. While this is necessary for efficient operation, it has at least one disadvantage that some of our operating men fail to overcome—they soon become engrossed in their local conditions and lose sight of the very important fact that the districts under their jurisdictions are but links of the one big chain which comprises the entire system. It often holds true that a heavy competitive movement of some one commodity will be either originated or delivered to a road at a point necessitating its passing over several districts of the system before reaching its destination or connecting line. These districts, as a rule, have different physical conditions; necessarily some classes of power would be rated differently on these districts.

The idea is to meet the road conditions, when possible, by changing the combination of power used, instead of by breaking up the train. A train then would be able to pass over the entire line in its original make-up and avoid the greatest part of terminal delays now entailed in breaking up the old and building the new trains. The benefits gained by changing the combination of power instead of the make-up of trains cannot be enumerated so easily. Instances have been known of cars losing their identity, traveling in manifest trains part of the way, in slow trains part of the way, and even experiencing association with local trains. The tracing of delayed cars would be very much curtailed and an all-around better service would be gained which is, after all, the best advertisement a road can have.

The fourth—that of providing the terminals with sufficient information in ample time to avoid unnecessary use of empty power in both directions—is somewhat more complicated than the preceding phases. The problems heretofore were originated and solved within the bounds of one system. We now come to a problem, the solution of which very often depends upon the co-operation of many systems. Most of the waste of running light power in both directions takes place at junction points, owing to the lack of co-operation between connecting lines in exchanging transportation information. The reason given in such cases is usually “unexpected business.” Why should there be such conditions? The cars were in transit for some time before they reached the junction point. It was, therefore, not a case of “unexpected business,” but that of “unannounced business.” There is no question as to the benefit to be derived from such information if it can be made reliable and transmitted in proper time. All realize the value of such co-operation, its feasibility, and comparatively small cost, yet no one has taken the initiative in bringing it about.

The fifth and last phase mentioned is the necessity of ascertaining whether or not the yard offices are guided by the official ratings and are computing train tonnage correctly. It was stated truthfully that every man, no matter what his field of endeavor may be, will do better work when he is being checked and compared with others. Many a good method has been installed on different systems which has gradually lost its effect on account of not being supervised and checked.

Having worked out the proper ratings, and combinations of power, and having provided, as far as possible, the transportation information necessary for the terminals, it remains to provide the necessary means to enable the bureau to be in constant touch with the entire workings. It must arrange for a daily report compiled under the supervision of the chief dispatcher or trainmaster for both directions in each district, showing the following information concerning all through freight trains leaving their terminals during each 24 hours: the train number, the time of departure, the class or number of the locomotive or locomotives, its or their ratings, the actual tonnage at departure, and the change of tonnage, if any, while passing through certain specified points on the district. The report should also include reasons for sending out trains underloaded.

Such a report will enable the bureau to make monthly statements, showing the tonnage lost on any district, as well as its causes. In many cases the management may decide that it will be profitable to undertake to remove the causes of some of the losses, while in others the judgment of the men in charge of the making up of trains may be criticised and new instructions issued. Monthly charts displaying the daily operation of through freights by districts have proved very helpful in maintaining interest in this work. The men in charge of the bureau must have time to get around as often as practicable and discuss the train load situation with individual yard offices. Letters are never as efficacious as personal interviews.

The problem thus resolves itself into the following: The management should organize a special bureau to deal with the “train load.” The bureau should have a personnel sufficient to enable the man in charge to leave the office whenever he finds it necessary to make a tour over the system. It is preferable for this man to have a scientific training in addition to a practical knowledge of transportation for his work is largely that of research. He must be able to keep his theories under cover when outside his office, for only then will he succeed in his main task—that of creating and maintaining co-operation. The bureau is to analyze the existing transportation conditions, ratings, combinations and distribution of power used, to standardize practices and to follow applications and effects. It must carry on its work by leading instead of driving. Monthly charts showing operating results and comparisons are to be employed. The charts should be plain, requiring but very little effort on the part of the general and local officials for their analysis. Scientific terms are to be avoided when possible, most especially when they can be replaced by colloquial railroad expressions. The bureau should start on a comparatively small scale and work its way up until it includes all branches affecting the efficient operation of trains.

#### THE APPLICATION OF SIMPLE PRINCIPLES

By O. S. Beyer, Jr.

Railway Engineering Department, University of Illinois, Urbana, Ill.

The primary object of increasing the train load is to move freight more economically. Before improvements can be made in this direction it is necessary to be able to control the loading and operation of trains in strict accordance with all those elements which have an effect on economical freight train movement. This control can only be secured when it is understood how these elements affect train loading and when a workable system is adopted which takes into account the relation of these elements to train loading.

For the purpose of adopting a train loading system, or checking up and improving it, if one is already in use, the services of a dynamometer car are valuable but not indispensable. Train loading or tonnage tests can be made daily under the supervision of a train master or a road foreman of engines in collaboration with the chief dispatcher if they

understand the principles. Different tonnage trains consisting first of heavy cars and then of light cars should be run over the division, and their performances compared. Results secured thereby, together with calculations based on the profile and locomotive characteristics, should furnish a basis upon which to establish a rational flexible tonnage rating system. This having once been done and a start made in the direction of adjusting train weights scientifically to the hauling capacity of the motive power many chances will immediately crop up to improve the average train load.

First it will be discovered that the question of accurate train weights is of greater importance than ordinarily imagined. Why? If it is not possible closely to determine the actual weight of trains as they are made up in terminal yards it will not be possible to load the motive power uniformly in accordance with its hauling capacity. Thus one train will perform differently than another, overloading, stalling, or consuming excessive time from station to station in one case, and in underloading and loss of engine and train crew efficiency in the other. A distinct economic loss follows exactly in proportion to the degree of inaccuracy which prevails in making up train weights.

Every effort should therefore be made to get individual car weights as correct as possible. Since train weights are almost invariably determined from the car weights entered on the way bills a campaign should be started to have the actual car weights carefully entered on all way bills as soon as they are originated. A close check of this situation on most railroads will reveal a very clear opportunity for improvement. Empty car way bills particularly are offenders. All that is necessary for an agent or a clerk who originates such bills to do is to look at the light weight stencils of the empty cars and enter them on the bills. When train checkers or conductors find such bills they should be instructed to insert the car weights when they check their trains.

Another important matter in this same direction is the proper determination of the weights of cabooses. Freight train cabooses are usually thrown into the whole train weight at 15 or 20 tons each. As a matter of fact they may weigh as much as 30 tons. All cabooses should be weighed with their full equipment on board, their weights clearly stencilled on the sides, and then treated the same as any other car in the train. Guess work and lazy man's work should be discouraged and eliminated by example as well as preachment.

The next thing which will be discovered is the improvement which will follow by loading cars more nearly to their capacity. The greater the individual car weights are, the more tonnage can be hauled in a train, for freight train resistance does not increase in direct proportion to the increase in the weight of cars. A loaded car of 75 tons which is  $3\frac{3}{4}$  times as heavy as an empty car of 20 tons only pulls  $1\frac{3}{4}$  times as hard as the empty car on a straight and level track at the usual freight train speeds. A knowledge of this fact alone should be a sufficient reason for every one interested in increasing the train load to try and get more load into individual freight cars.

Another very important opportunity for improving the train load lies in the proper making up of trains so that as many loaded or heavy cars as possible are placed into each one, thus avoiding the running of trains composed of empty or light cars. This arrangement will often prevent sending trains out which have had to sacrifice tonnage on account of having reached the car limit. Hence whenever there is a heavy movement of empty cars a great effort should be made to get loads into each train. A little foresight in this direction will go a long way, and alert division officials will find opportunity, when empty car movements are heavy, to protect the tonnage of individual trains by accumulating some heavy cars containing slow freight and distributing them judiciously in light car trains.

The importance of the element of time in train movement

will be appreciated much more than ever before. One of the reasons most frequently advanced regarding the impossibility of loading locomotives to their maximum capacity is that trains so filled out take too long to get over the division. It never seems to occur to those who are responsible for such a statement to make improvements which will save train time for the purpose of making possible greater train loads. Many opportunities present themselves continually in this direction and the first ones to realize their significance should be the train master, the road foreman of engines and the chief dispatcher. Their spirit should be such that they are always on the lookout for a chance to save a few minutes as each train makes its way over the division. They should everlastingly be driving this point home.

Many little physical improvements along the right of way and to the motive power will help accomplish this same object. Telephones should be installed at passing sidings to enable train crews to get into quick touch with tower men or division operators in order to get needed information instead of wasting time to walk a mile or more to ask for it. The lengthening out of passing sidings to prevent trains sawing by not alone saves time, but also permits increasing the car limit. Occasionally the installation of a crossover makes possible the utilization of the opposite main track in order to keep trains moving. Improvements to locomotives such as the application of brick arches and superheaters make it possible to operate trains at higher speeds over the division. The true worth of such betterments becomes doubly significant in the light of saving train time with the ultimate object in view of increasing the train load.

Lastly and above all else it should become apparent to the management of a railway organization that one individual at least should be included in the organization who is the best authority they can secure on this matter of train loading. The discharge of his duties should be confined solely to this field. He should be the pacemaker in all matters seeking to increase the train load. A careful systematic study of all the problems involved should be followed by suggestions, recommendations, and the initiation of such steps as will help effect the desired improvements. He should work with the division officials, getting from them the benefit of their experience which results from their intimate contact with the daily problems of operation, and apply it to his studies of the train-loading question. He should enlighten them on the principles underlying his work, develop in them an appreciation of the importance of the problem, encourage them to co-operate with him, and in general prepare the ground for an active campaign on the part of every one to help increase the train load. As the leading authority of the organization in his field, his assistance should be sought by all who are anxious to improve their loading conditions. He should be consulted on all the questions of physical property and operation improvements which affect the problem. An energetic man with a sound training in the fundamentals of train loading science, having had experience in the practical application of these fundamentals, will prove astonishingly valuable.

#### SOME OF THE REMEDIES

By C. B. Wildman

Division Superintendent, Missouri Pacific; Jefferson City, Mo.

In order to secure and maintain an increased train load effectively, it is important, and in fact absolutely necessary to proceed along definite lines. It is an easy matter to formulate some plan and issue instructions accordingly, but it is an entirely different matter to have such instructions rigidly complied with; therefore, the success of whatever plan of campaign is decided upon will depend almost entirely upon the manner in which it is followed from day to day. Perfunctory or occasional checking will not secure the desired result, and a definitely fixed train loading can only be maintained by checking carefully the tonnage of each train every

day. A very good plan is to provide space on the train sheet for dispatchers to show each train with light tonnage and the cause. This will also assist in reminding the dispatcher of his responsibility in seeing that this important feature is not overlooked.

The first thing is to establish the maximum rating of the engine definitely. The superintendent, trainmaster and master mechanic or road foreman of engines, should satisfy themselves by actual tests as to what the engine will handle under favorable working conditions, bearing in mind the theoretical rating, and endeavoring, if possible, to reach that or better. Once the maximum rating is established, the engine should be rated accordingly and the division officers and employees should be required to interest themselves sufficiently to see that the rating is maintained, due allowance being made for weather or other adverse conditions. Care should be taken to see that the yardmaster is interested in getting each train out of the terminal with its full tonnage. Too many trains leave the terminals a few tons short. The last car should be put on to bring the tonnage up to, or a few tons over, the rating. If this practice is closely followed it will result in a material saving of train miles in the course of a year.

It is the practice on some roads to run empties in solid trains, giving them the car limit, but not always the train load. This is sometimes necessary in emergency, such as an extreme shortage of certain classes of equipment, but it is important to see that the practice is not indulged in unnecessarily, as it is more desirable from a tonnage viewpoint to handle trains of mixed loads and empties in order to shorten the train and haul the maximum load.

Another cause of loss in tonnage is the indiscriminate handling of short loads and empties on through trains. Such business should be confined to local freights, and where the business amounts to more than the local freight can handle, it should be bunched and handled in one train each day. This train can either be filled out on the line, or turned at some convenient point after it has fulfilled its mission. The handling of short loads on through trains not only results in delay but usually in the train running with light tonnage in the direction of traffic over at least a part of the district.

I believe one of the most practical means of increasing the train load, and one that has probably been given the least attention, is that of increasing the car load, in other words, loading the car to its capacity. Fifty, and perhaps 75 per cent of all the cars handled are only partly loaded. One can readily understand the effect of these partly loaded cars on the train load, and the remedy does not lie altogether with the Interstate Commerce Commission, although, in my opinion, a definite campaign toward the accurate compilation and proper presentation of certain information to that body would, in course of time, bring gratifying results. In the meantime, it is within our power to improve this condition and secure some measure of relief. Our patron, the manufacturer, is a business man. He can see at a glance that it is not good business for a railroad to haul a car 500 or 1,000 miles containing only half a load. He can, and often will, instruct his salesman to sell a heavier load. He is in a position to give his customer a good reason why this is necessary, and the influence of the jobber over his customer should not be underestimated. We should show this patron of ours that we are interested in him and that we are willing to lend our aid to make his business a success. When we do this we can expect his friendship and co-operation, not only in the temporary relief before mentioned, but in the securing of permanent relief which we have a right to expect will be given later on.

Many railroads are operating long freight districts, some of them 150 to 170 miles. It is an impossibility to move trains of maximum tonnage over such districts, because their movement must necessarily be slow. This, together with the

usual unavoidable delays, such as meeting and passing trains, cleaning fires, crews stopping for meals, hot boxes, etc., will, in many cases, prevent the movement of the train over the district within the hours prescribed by law. It is also probably true that the full efficiency either of the engine or the employee cannot be obtained on such districts. Given a freight district of approximately 100 miles, there is no apparent reason why the locomotive and the man should not render efficient service. It is not necessary to provide an elaborate freight terminal every 100 miles to put such a plan in operation. A few tracks will take care of the situation, as no switching or breaking up of trains would be done at these points. The engine's fire should be thoroughly cleaned, a fresh train and engine crew put in charge and the train could proceed with little delay, and its maximum tonnage. The answer would be found in the road's statement of operating expenses.

Another source of lost tonnage is found in the handling of "time freight" schedules. For a number of years the railroads have been in sharp competition with each other in shortening freight train schedules at the expense of tonnage. There does not seem to be any adequate reason why a business man can reasonably expect to purchase an ordinary bill of goods in Chicago and have them delivered to him by freight in St. Louis, about 300 miles away, the following day, nor does there seem to be any good reason why brick, lumber and other such commodities should be symboled and classed as time freight, except that "they all do it."

Stock, perishable freight and merchandise, properly belong under the classification of time freight, and should, of course, be handled as such, making whatever reduction in tonnage necessary to maintain the schedule. Dead freight trains should be run with as much regularity as possible, bearing in mind the importance of the full train load.

#### THE USE OF TONNAGE DIAGRAMS

By J. J. Glass

Chief Draftsman, Chicago Great Western, Chicago, Ill.

Divisions on some roads are too long. On engines with long fireboxes, and firemen nearing the end of a long run and tired out, most of the coal is placed at the rear end of the firebox and not enough at the front end, thereby securing an uneven fire surface, resulting in a drop in the steam pressure and consequently reducing the effective tractive effort of the locomotive and generally the stalling of the train. This seems to be a reasonable explanation why some locomotives will pull a certain load over a hill, while others are required to "double over," both trains consisting of approximately the same tonnage. In such cases, the possibility of giving the firemen more rest between trips or a change in the division points should be considered, or in lieu thereof, a "relief point" for the crew, or the adoption of mechanical stokers, which are no longer an experiment.

Where possible, enginemen should approach the bottom of a hill at a speed which will enable them to acquire sufficient momentum to carry the train over; except in cases where the hill is too long and the momentum acquired would fall to zero before reaching the summit, in which case the tractive effort of the locomotive must alone be depended upon to carry the train over. (The Chicago Great Western operates 1 per cent grades approximately one mile long as velocity grades, passing the bottoms of hills at 25 miles an hour.) Diagrams should be prepared to show the distance in feet that a train's momentum will carry it on various hills for speeds varying from 10 to 40 miles per hour. The profiles should be studied with the help of these diagrams as it may be possible to operate a division or subdivision entirely on momentum grades, even if one hill should be too long, it would pay to double over, considering the excess in tonnage handled.

Some railroads have found in actual practice that the

theoretical engine rating used was inadequate; that the constant of resistance (4-6) used in figuring the rating was too high. In making up trains, yardmasters did not consider whether the cars were fully or partially loaded, or empty. In other words, it was not the practice to equate the rating to the number of cars. Even now some roads use the old practice of loading a train until the engine rating is reached, and they then wonder why the locomotives stall and are compelled to "double over" certain grades. (See Fig. 2.) This is, nevertheless, the everyday experience of most railroad men, and it is attributed to the fact that they have failed to consider the number of cars in the train.

Some roads use adjusted ratings, i. e., adding a certain car factor (5 or 6) to the weight of each car, and then adding together the weights of cars plus the car factors until the adjusted rating is reached. Fig. 3 shows the resultant loss in tonnage.

In order to obtain the maximum tonnage that an engine is capable of handling on ruling grades, the following rules should be observed: Engines should be tested to ascertain

tonnage that the particular class of engine is capable of hauling over a certain district without stalling.

Figure 1 represents an equated tonnage diagram used by the Chicago Great Western under ordinary weather conditions, with the temperature above 32 deg. C represents the point on the tonnage curve ordinarily arrived at in calculating engine rating, using 5 lb. per ton as train resistance. The shaded portion A, C, E, Fig. 2, represents the loss in tonnage if this practice is adhered to, while the unshaded portion C, B, D, Fig. 2, represents the chances of stalling if the train contains more than 84 cars, the engine being rated for 1970 tons. A, F, Fig. 3, is the adjusted tonnage rating, and the shaded portion A, B, F represents the loss in tonnage.

#### SECURE THE CO-OPERATION OF THE MEN

By Stephen H. Brown

Chief Dispatcher, Great Northern; Melrose, Minn.

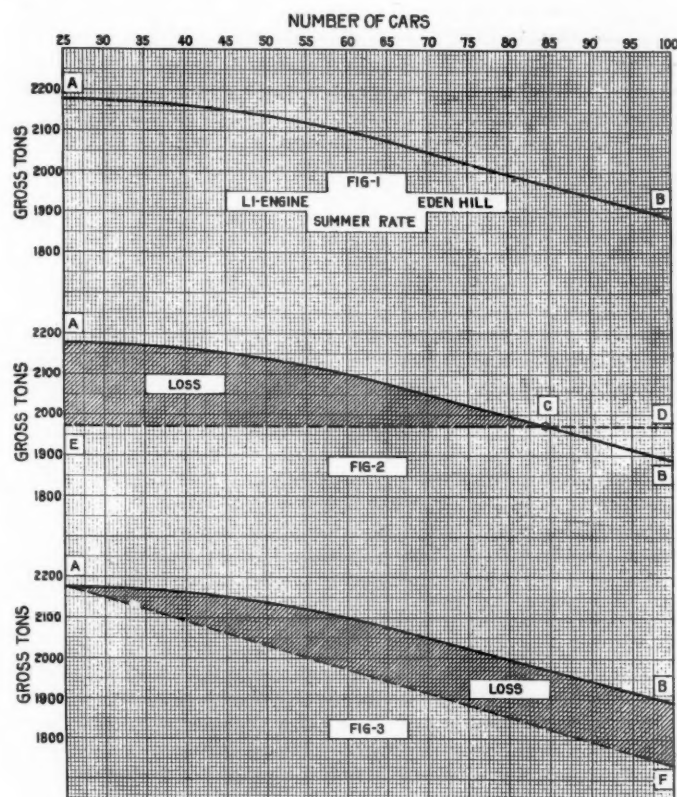
One of the first essentials in an endeavor to increase train loading is to inspire trainmen and enginemen with a feeling of pride in their achievements. How best to bring about this desirable result is a problem in itself worthy of the most careful consideration.

Under present methods of operation little or nothing is left to the discretion of conductors and engine drivers. An engine is rated at so many tons, and certain handicaps are permitted such as the deduction of a stated number of tons per car where a given number of empty cars are handled. It is this method of rating trains which puts into the minds of trainmen the mental attitude many of them have acquired.

A practical case in point illustrates what I mean in an illuminating fashion. A heavy movement of empty cars was being made on a transcontinental railway. The engines were rated at 1,500 tons, which they handled successfully. The rating sheet authorized a handicap of 6 tons per car for all empties over 20. The cars were principally box cars, running 17 to 19 tons light. Trainmen and yardmen rated these trains on the basis of 17 tons for the first 20 and 23 tons for the remaining cars, and were handling 69 to 70 cars per train. The performance indicated light-loaded trains. An arbitrary 90-car limit was established, which was later raised to 95, and this brought the performance to correspond with loaded trains.

As a matter of common knowledge among men actively engaged in train operation, and the administration of the problems involved, actual tonnage does not always indicate train resistance. What is needed is a simple formula for the guidance of simple men (and this is not said in derogation). Engine ratings based upon tractive power and other technical data are not entirely satisfactory, nor does a test rating offer a reliable solution of this important problem. Such ratings usually are made under favorable conditions with the supervision of trained officers assisted by selected employees.

"A chain is no stronger than its weakest link," aptly describes the condition which exists upon a railway in its efforts to establish workable train ratings. We all know that Jones, for example, is a more efficient performer than Smith. Therefore, it is up to the railways to establish a minimum standard of efficiency for men before there can be a maximum degree of efficiency for machinery. When railways can rely upon employees to play a straight, fair game, it perhaps will be possible to secure the most profitable returns in train load that can be devised. The tendency now, unfortunately, is for employees in train service and elsewhere to share imaginary grievances with a too susceptible public, which is ever ready to align itself against oppression. The dissatisfaction it feels is not the result of widespread mismanagement, as it believes, but of universal misunderstanding of the difficulties under which railway managements labor in striving to maintain a grip upon the situation against the



whether they are capable of maintaining the required steam pressure. Levels should be run on all ruling grades or at least on the hardest pull points. It may develop that the profiles are not identical with the present condition of the track. In calculating the tractive power, the mean effective pressure obtained from actual recent tests should be used. After having calculated the tractive power, equated tonnage diagrams should be prepared on graphic sheets as shown in Fig. 1. Each sheet should cover one class of engine over a defined district. In the preparation of the diagrams, the grade (compensated for curvature) should be selected at the hardest pull points, always considering the length of train. Proper and careful consideration should be given to wheel friction and weather conditions. Ordinarily three ratings, giving summer rates above 32 deg., winter rates between 0 and 32 deg., and severe winter rates below 0 deg., should be shown on every sheet.

In making up trains, yardmasters should be instructed to follow the diagrams closely, as they represent the maximum

opposition of those whose intentions, good or bad, serve only to clog the machinery of railway operation.

#### SOME OF THE ESSENTIALS

By E. J. Worden

Division Superintendent, Chicago, Burlington & Quincy;  
Galesburg, Ill.

The first thing that has to be considered in making a tonnage showing is to have the motive power in condition to handle 100 per cent rating at all times. Every case of failure of an engineer or engine to handle full rating should be taken up with the mechanical department immediately to avoid a loss of tonnage on the next trip of that engine or crew. Slow orders over bridges or track at the foot of a hill deserves considerable attention to avoid having to reduce tonnage on trains to enable them to get up the hills after moving over this slow track. The fuel and water supplies should be satisfactory to avoid setting out trains or running light. This is especially true in cold weather.

On lines suitable for heavy power, everything possible should be done to avoid running small power. Short loads on any line should be confined to way freights or one short load train. On lines where excess tonnage can be handled on either end of the run, cars should be accumulated to be used to fill out through trains.

#### READING MATTER FOR SOLDIERS

The railways of the United States are being given an opportunity to assist in providing reading matter for the soldiers. The War Department, through the Commission on Training Camp Activities, has asked the American Library Association to assume responsibility for providing adequate library facilities in the 32 federal training camps now being established for the National Guard and the National Army. The association has organized a war service committee, of which J. I. Wyer, Jr., of New York State Library, is chairman, and a sub-committee on transportation, of which R. H. Johnston, librarian of the Bureau of Railway Economics, is chairman. It is proposed to establish libraries at each of the training camps where books collected and donated by libraries, by publishers and by the general public will be housed in charge of two or more trained librarians who will, in addition to supplying recreational and general reading matter, seek out among the young men called to the cantonments and training camps those desirous of continuing courses of study or of undertaking reading to fit them for their occupations after the war.

An important practical problem is the transportation of the material collected under the auspices of the American Library Association to proper centers and this problem has been placed in the hands of Mr. Johnston, who is asking the various railway companies to assist in the work. Several railway companies have already indicated their willingness to transport as railway mail donations from persons on their lines to the most convenient terminals. Provision is made by the American Library Association for the prompt removal of these donations from the terminals by agents who will see that they reach the camps.

Some of the carriers have also arranged to prepare and place a poster notice calling attention to the need of the cantonments for books and magazines and naming places where or officers with whom they may be left. They are also issuing orders to employees involved to parcel and ship in to the main terminal, where the books and magazines are removed by the agents of the library association. In a memorandum to the railways regarding this work, Mr. Johnston points out that within a few weeks nearly 1,000,000 men will be in cantonments, training camps or at the front. Among them will be men hitherto dependent upon and trained to

the use of books; men not so dependent and not so trained, who might under the unusual conditions be influenced by books; men taken from occupations or professions in which the books supplied to them would lessen to a degree the loss of opportunity caused by their country's call, and other men for whom merely recreative reading would be a beneficial influence to counteract the tedium and temptations of camp life.

Among the early war innovations in Germany was the organization of traveling libraries for the various army corps. Great Britain adopted a similar plan, by which every fortnight boxes of books are sent to every unit of the expeditionary forces. While the National Guard was encamped on the Mexican border the Y. M. C. A. and various libraries cooperated to furnish reading matter for the soldiers. In Great Britain transportation of books and magazines was handled both by the post office department and by the railways, which conveyed free of charge packages of books and periodicals despatched by properly constituted and recognized organizations. As the work will be in the hands of an organization representing the skilled library profession, the railways may safely be assured that such assistance as they may render will be most efficiently applied.

The Library of Congress has issued a pamphlet compiled under the direction of Herman H. B. Myer, chief bibliographer, on "The United States at War," giving references to the organizations directly and indirectly engaged, and to the literature on the subject, containing many references to commerce and transportation in war. It has also issued a bibliography of recent references on railroads in war. The library of the Bureau of Railway Economics also has available for distribution a special list of references on railroads in war which was originally issued on October 10, 1914, but which has been extended in mimeograph form to August 2, 1915. The bureau has also compiled a list of references relating to employment of women on railroads and street railways.

**ELECTRICAL SUPPLIES FOR SWISS RAILWAYS.**—In developing the plans for electrification, the government has created a special department, under the management of the Swiss Federal Railways, known as "Direktion für die Einführung der elektrischen Zugförderung der Schweizerischen Bundesbahnen, Berne, Switzerland." This department announces that it is prepared to consider proposals for sale and delivery of such electrical material as may be necessary for equipment in connection with this work, and that bids will be received from all countries. A statement by the management shows that large orders for copper wire already have been placed with certain firms in the United States, and that British and German firms are applying for details in order that they may submit offers.—*Commerce Report*.

**FREIGHT CONGESTION IN RUSSIA.**—The American Consul at Dairen cables June 6, 1917, as follows regarding shipping conditions in Russia: For Moscow and other cities shipments are long delayed at several places and cars are seldom available. All difficulties are confined to the Russian railroad, which is now taking only 300 tons of through goods daily, and from Dairen less than 120 tons, while there are several thousand tons here awaiting shipment. For through goods arrangements can be made to Harbin, Manchuria, only; for points beyond, arrangements are to be made at Harbin. Local forwarders can get goods through to Russian cities sporadically if the goods are here ready for instant shipment. Dairen is the best port for goods requiring trans-shipment, because there is no duty, insurance is low, storage in private godowns is cheap, and the facilities are superior to the chosen route. No parcel post packages for Russia have been accepted since May 29, and the embargo is indefinite.



View of the Building Before Completion from the Street Side

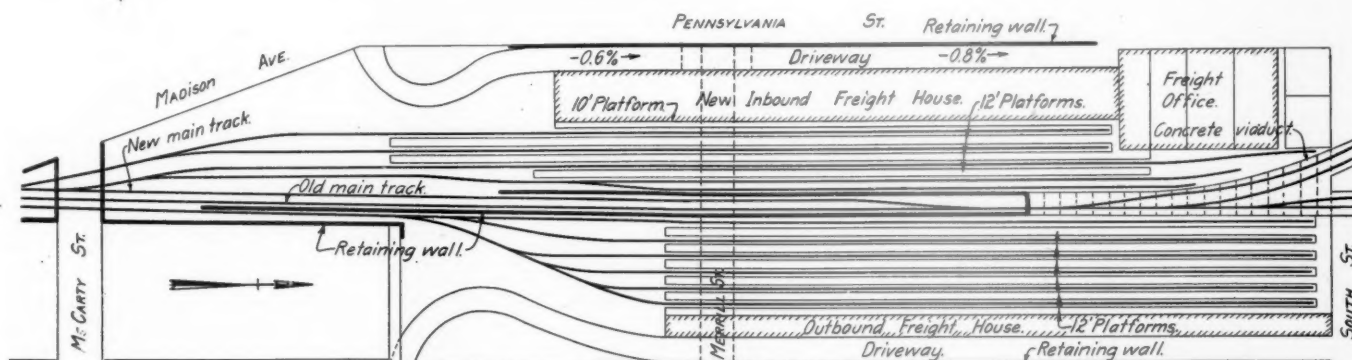
## Pennsylvania Freight House at Indianapolis

**New Inbound House and Tracks Are Being Built to Modern Standards. Several Interesting Details Developed**

THE Pittsburgh, Cincinnati, Chicago & St. Louis is now completing a new inbound freight house layout at Indianapolis, Ind., which is of modern construction throughout. This structure and its tracks occupy all the land between South Pennsylvania street and the main tracks and extend from South street to McCarty street, with the exception of an area 250 ft. by 140 ft. at the corner of South and Pennsylvania streets. By agreement with the Board of Public Works of Indianapolis, dated August 19, 1912, all streets and alleys within this territory except Merrill street, were vacated, together with a strip 14 ft. in width

ing the driveway, freight house and tracks over this street on steel work. It also required the building of a retaining wall along Pennsylvania street.

This subway and retaining wall were constructed by railroad forces in 1913 in connection with the elevation of the main tracks and the outbound freight house layout. As this work required a number of construction tracks which could be reached from the elevated tracks, excavation for the inbound freight house was started and the material was used as fill. The lead to the ultimate freight house tracks was completed in 1914. The contract for the construction of



Map of the Freight House Layout

along the east side of Pennsylvania street extending 540 ft. north of the north line of Merrill street and a 9-ft. strip from Merrill street to Madison avenue.

It was the original intention to build the freight house on the grade of Pennsylvania street, but the city's plans for track elevation were then being prepared and a subway was required at Merrill street which would extend under the entire layouts for outbound freight, main track and inbound freight facilities. This was secured by depressing Merrill street about 8 ft., building the inbound freight house and tracks on an 0.8 per cent grade north of Merrill street and a 0.6 per cent grade south of Merrill street and carry-

ing the inbound freight house proper was awarded to the Wm. P. Jungclauss Company, Indianapolis, Ind., on December 21, 1915.

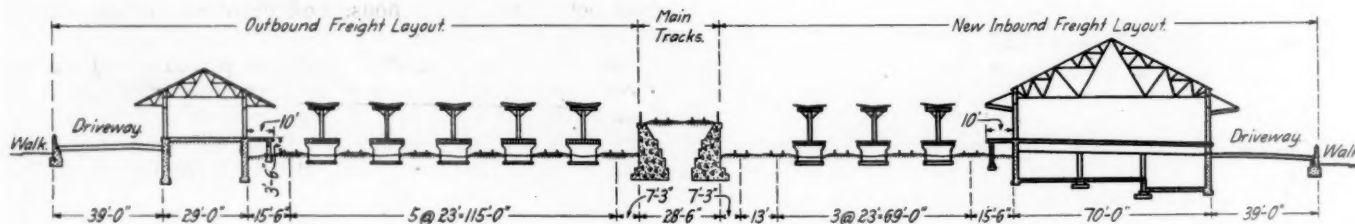
The general arrangement of the inbound layout is shown on the drawings. The driveway on the west side of the building extends the full length of the house and is 39 ft. in width, being reached from Pennsylvania street at the north end and from Madison avenue and Pennsylvania street at the south end where there is a curved approach 350 ft. long on a 3 per cent grade. The building is 790 ft. long and 70 ft. wide. A basement is provided for storage which is reached from the Merrill street subway, only

25 per cent of which is being finished at present, giving ample room for future development.

The first floor, which is on the track level, provides a large area for all freight handling. On the east side of the house is a 10-ft. platform protected from the weather by a shelter roof suspended from the side of the building. Five tracks and 3 island platforms, each 12 ft. wide, are covered

grade conforms to the grades of the tracks which are 0.6 per cent and 0.8 per cent, while across the building there is a fall of  $\frac{1}{4}$  in. to 1 ft. All trucking is down grade from the cars to the teams or trucks.

The fender on the side of the building along the main driveway and also along the basement driveway consists of 8-in. channels, concreted in place and held by countersunk



Cross Section of the Freight Terminal

with sheds of the butterfly type. On account of the track elevation work not yet being completed, only 3,010 lineal feet of platforms are now being built; this gives an unloading capacity of about 115 cars. This will be increased by about 20 cars when the elevation work is completed.

The building is divided into four sections by means of brick fire walls, all openings in which are equipped with metal fire doors; each section is provided with one 4-in. fire hydrant and 100 ft. of hose. A small room is provided in each section for freight checkers, while each section also has one set of beam scales and a hatchway for an elevator to the basement.

The offices in the second story are formed by means of a dormer in the center of the building, the floor being supported on the bottom chords of the roof trusses. The central fire wall divides this second floor into two parts, each of which is again divided by the use of hy-rib partitions, giving four good-sized rooms for the use of the freight

anchor bolts. The tops of these channels are level with the trucking floor, instead of 4 in. to 6 in. below as has been the general practice in the past. Along the trucking platform on the east side of the house, a metal groove, 1 in. wide and 1 in. deep, was placed about 20 in. from the edge



A View During Construction

house foreman and his clerks and for records. These rooms are reached by steel stairs supported on brackets fastened to the fire wall. In the finished portion of the basement a large warming and locker room is located for the use of the freight handlers. A toilet room and a boiler room with coal and ash bins extend under the platform on the east side of the building.

One noticeable feature of the main floor of this building is that it is sloped in two directions. From end to end the



An Interior View of the House

of the platform for the entire length of the building. This groove affords a place in which to hook the steel plates used to bridge over the gap between the cars and the platform.

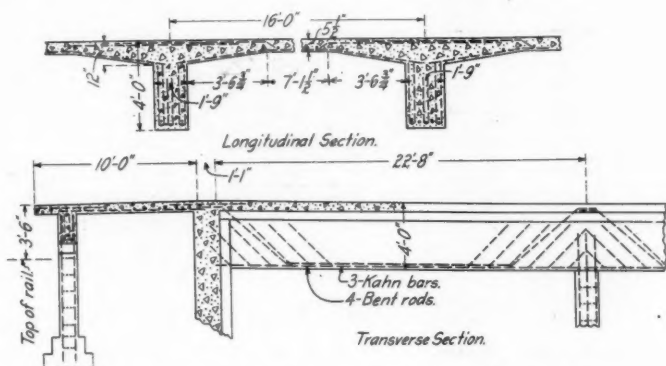
As mentioned above, the excavation for this building was begun by railroad forces and about one-third was completed, leaving almost 8,000 cu. yd. for the general contractor. This work of excavating and backfilling was handled entirely by teams and wagons, the material being used to fill for the driveway along the west side of the building and to backfill against the building.

The foundations for the inbound freight house were designed in conjunction with the Trussed Concrete Steel Company and consist of an 18-in. concrete wall with a reinforced floor slab supported on beams and columns. All footings were carried down to a sandy gravel capable of supporting four to six tons per square foot.

All bearing walls above the level of the first floor are of brick, the face brick being selected penny pavers with round corners. The backing brick are a common hard brick. All stone copings and chimney caps are of Portage red sandstone, all pieces of which were firmly anchored and embedded in mortar colored to match. Cement mortar was

used throughout in connection with hydrated lime and local sand, while Jamestown black coloring was used with the mortar on face brick.

The steel trusses rest on the brick walls and span the entire width of the building. These trusses are riveted together with channel purlines which serve as a base for



Details of the Freight House Floor

the reinforced cement tile roof. On the ends of these trusses are fastened tee-iron hangers which extend down to a 10-in. channel, forming the outer edge of the roof over the trucking platform. This roof is 10 ft. wide and is formed of 4-in. by 10-in. yellow pine rafters, 32 in. apart on centers, extending from the channels into the brick work. On these rafters is placed yellow pine sheathing 1 5/8 in. thick, beaded



The Track Side

on the under side, making it conform to the city building code for slow-burning wood construction.

The roof over the platform slopes from the outer edge toward the building, and consists of five-ply asbestos felt, made and applied by the H. W. Johns-Manville Company. The flashing against the building is secured by means of a tile raggle block into the recess of which the roofing is carried and sealed. As there is no conductor on the upper tile roof all water, snow and ice drops about 8 ft. onto this

roof, putting it to a severe test. The roof of the freight house is of reinforced, red cement tile, built in sections about 2 ft. by 4 ft. in size, made and applied by the Federal Cement Tile Company, Chicago. Built in with the platform roofing are lead sleeves with 3-in. flanges on top. These sleeves extend down through the roof into 4-in. wrought iron downspouts connecting to the sewers running along both sides of the house and draining into the sewers in Merrill street.

Kinnear type rolling steel doors are placed at all outside driveway and platform doors, these doorway openings being 10 ft. high and 12 ft. wide. Fenestra steel sash are used throughout. As the windows are placed above the overhang, they afford ample light during the day without the use of skylight glass in the tile roof.

The main floor of this building is of 1 1/8-in. maple, with a 2 1/2-in. surface, and end matched. This extends out on the east platform to within about 2 ft. of the edge and is laid on, and blind nailed to, wedge-shaped sleepers cut from



The Driveway and Street Doors

3-in. by 4-in. hemlock and creosoted. These sleepers were laid on the reinforced concrete slab, 16-in. apart on centers, brought to an even surface on top, concreted into place with a lean mixture of concrete, and run parallel with the length of the building, while the maple flooring is laid across the building rather than on the diagonal.

The scales, four sets in all, were made in the railway company's shops at Columbus, Ohio, and are suspended from the concrete beams supporting the floor, which leaves the space below available for trucking. These scales are similar to, and in fact some of the parts were purchased from Fairbanks, Morse & Company, and are of the beam type.

The checkers' rooms are of hollow tile construction with hollow tile roof slabs. One of these rooms, 8 ft. by 12 ft. inside, is located in the center of each section of the building. The outside of these offices is of a plain sand plaster finish, while the inside is finished in white. These checker rooms are located on the track side of the house, the east wall, one-half of which is window, replacing one door. Two 14-in. Reznor heaters of the wall type, supplied with artificial gas, provide ample heat.

Steel and cast iron jamb guards protect the brick work from injury from trucks. The flashing around the dormer windows, the chimney and against the office building at the north end consists of a double copper flashing, well cemented

into the brick work. The wood work and roof trusses throughout the building were given two coats of Pennsylvania light standard building paint made at the Columbus shops. The steel doors were given two coats of standard box car red paint, while the door jambs and the remaining steel work were painted black.

The electrical work in the basement consists of a conduit concealed in the floor slab of the first floor forming the basement ceiling, with outlet boxes and lamps suspended on steam and keyless socket fixtures. On the main floor the conduits are all carried on the bottom chords of the roof trusses and have 25-watt lights with Monax glass reflectors suspended from conduit outlet boxes, one light being provided for every 250 sq. ft. of floor. Key switches on the side walls control 8 lights, 4 on each of the two trusses.

One American Radiator Company's down draft steam heater of 1500 sq. ft. radiation is placed in the basement, furnishing steam heat for the toilet room, the freight handlers' room and the second floor offices, no attempt being made to heat the main floor.

The driveway along the west side of the building was laid on filled ground after it was thought to have been fully settled. This paving is of the monolithic brick type, having a full 6-in. concrete base on which the best grade of hard Martinsville knobstone brick were laid and grouted, allowance being made for expansion along both curbs and about every 30 ft. by the insertion across the driveway of a 1/4-in. strip of "Elastite." A separate contract was given to the American Construction Company of Indianapolis on August 16, 1916, for the grading, curbing, sewers and paving. Work was begun on August 28, and completed November 24.

The three island platforms of the inbound layout consist of concrete piers 10 ft. apart on centers on which 2-in. by 12-in. joists were laid parallel with the tracks, supporting an oak floor of 2-in. by 6-in. and 2-in. by 8-in. boards 16 ft. long, laid at an angle of about 53 deg. This trucking floor is 12 ft. wide, the edge being placed 5 ft. 6 in. from the center of the track and 3 ft. 6 in. above the top of the rail. A shelter shed of the butterfly type is constructed over these platforms using 8-in. by 8-in. posts 20 ft. between centers and set in the center of the platform. Three-inch wrought iron downspouts with Holt leaders, connections and rosettes are placed on every other post. A 4-ply built-up asbestos roof is used. The platforms are lighted by single rows of electric lights with attachments for portable lights that can be carried into cars. These platforms were not included in the original cost or contract for the freight house and separate bids were taken for their construction. The contract was awarded to the Cuthbert Bros. Company, Pittsburgh, on December 16, 1916. Work was started at once and is still in progress.

A three-story brick warehouse stood on the extreme north end of the property purchased for the freight house. It was decided not to wreck this building but to remodel it for an office building for all freight offices and clerks, both outbound and inbound. Separate bids were asked for on this work and a contract was made with the Wm. P. Jungclaus Company in November, 1916. Work was started at once and it was completed about the middle of March, 1917. The basement of the building will be used at present simply as a boiler room and coal room where a new steam heating plant is installed. The first floor contains the freight cashier's office with three windows to serve the public, a 12-ft. by 12-ft. vault, a stationery supply room, toilets, a hot and cold room, and rooms for bonded and astray freight.

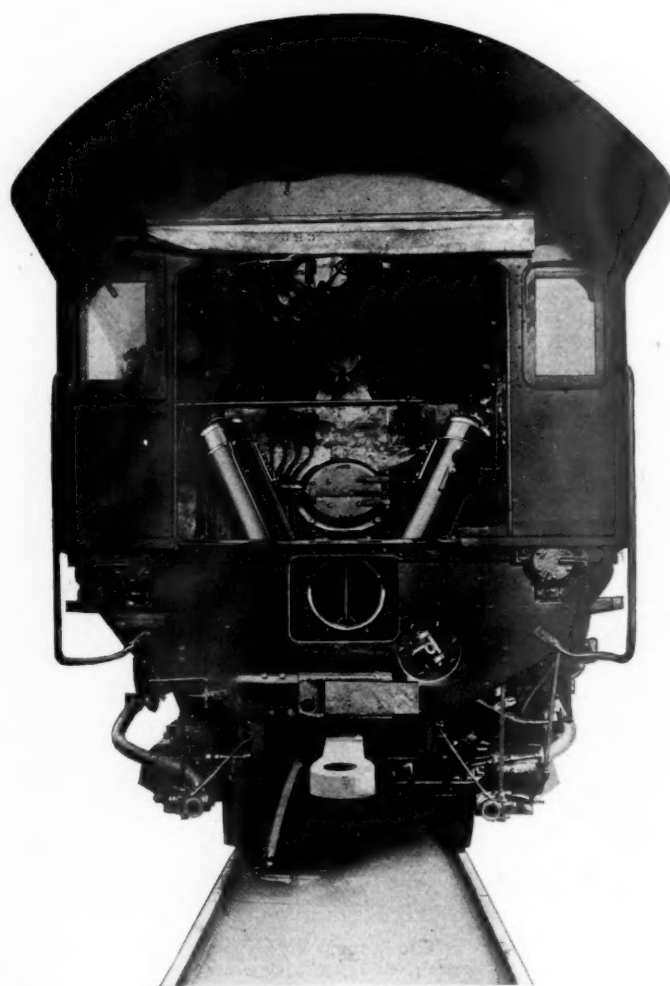
The second floor is arranged for three small offices for the freight agent, the cashier and their clerks and is also the main office room in which are all the inbound and outbound clerks, the telephone exchange, the vault and the toilet rooms. A light well has been placed between the second

and third floors and a skylight in the roof. The third floor is at present unfurnished and is to be used for the storage of records. All finished walls and partitions are made of hy-rib metal lath and plaster and the interior windows and doors are fitted with crystalline glass. Provision is made in all rooms for electric lights, electric fans and telephones. It is also the intention to install a pneumatic carrier system connecting each billing booth of the outbound house, each receiving booth of the inbound house, the cashier's room and the freight house foreman's rooms with the central station located in the main office room adjacent to the telephone exchange. A 3-in. tube will be used for this purpose and an air compressor located in the basement.

All plans and specifications for this freight layout were made in the office of W. C. Cushing, chief engineer maintenance of way, Pittsburgh, Pa., J. D. Moffat, Jr., was the engineer in charge at Indianapolis.

### DUPLEX LOCOMOTIVE STOKER

The Duplex locomotive stoker has recently been placed on the market by the Locomotive Stoker Company, Pittsburgh, Pa. This stoker is known as the Duplex type D and includes many features of the Street type C stoker. The new Duplex stoker has included in its construction a

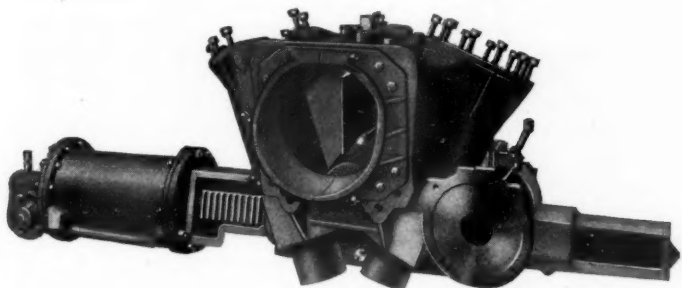


Cab View of a Locomotive Equipped with the Duplex Stoker

crusher which will handle lump coal, reducing it to the proper size before delivering it to the firebox. This eliminates the necessity of preparing the coal before it is placed upon the tender. It will handle slack coal as well as lump. The stoker occupies little space in the cab and operates practically noiselessly. Like the Street stoker it does not occupy

any of the grate area of the locomotive, nor does it obstruct the firedoor.

The Duplex type D stoker consists of a conveyor and crushing system, an elevating system and a distributing system, the entire mechanism being driven by a simple slow speed reversing engine. The coal travels through the stoker as follows: The shoveling sheet of the tender is provided with an opening 18 in. wide extending from the coal gates



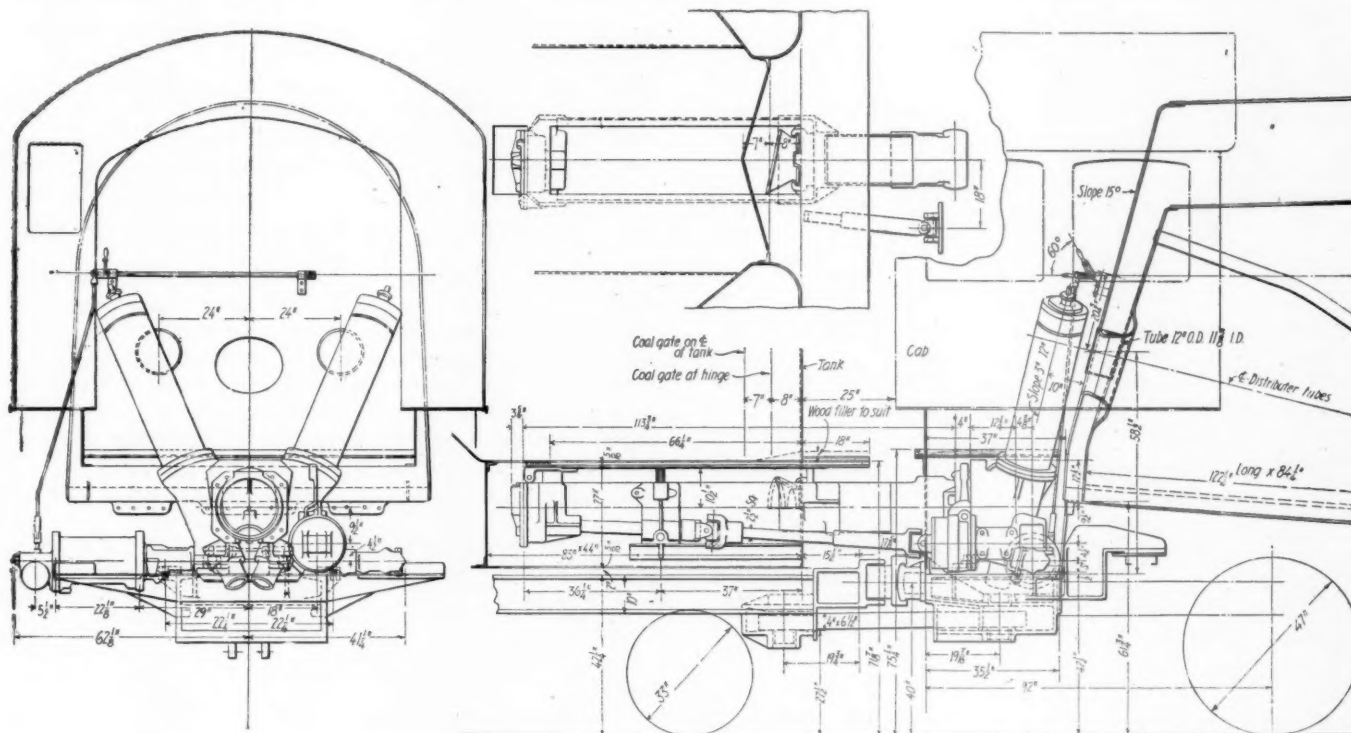
Transfer Hopper and Steam Engine of the Duplex Locomotive Stoker Showing the Vane for Distributing the Coal to the Vertical Screws

to the slope sheet. The opening is covered by slides, each measuring about 20 in. in length. After passing through this opening to the trough beneath, the coal is conveyed by the conveyor screw to the crusher, where it is forced against the crusher plate by the screw and broken to a suitable size. The coal then passes to the transfer hopper, where it is di-

The conveyor consists of a wrought steel trough in which is the cast steel screw and the crushing plate. The trough is supported under the shovel plate by two angles riveted on each side of the conveyor conduit, which forms bearings for rollers fitted on the arms of the conveyor slide support. This support is permanently secured to the bottom of the trough about 3 ft. from its rear end, thus providing flexibility to take care of the movement between the engine and tender. The lower angle bearings extend almost to the front of the tender and form a track on which the trough rolls when being removed from the tender. The conveyor unit moves with the engine, merely resting on the angle bearings in the tender, but when the engine and tender are parted it can be uncoupled from the transfer hopper and left with the tender. An angle ring fits into and around the top of the trough, preventing dust from blowing into the tender tank and coal from rolling over the sides of the trough.

The crusher is at the front end of the opening in the tender deck, and consists of a heavy plate with projections set in a slide in the trough. The smaller sizes of coal are carried through without crushing or breaking, but the larger lumps are forced against the crusher plate by the conveyor screws and are broken to the proper size for efficient firing, and go on to the transfer hopper. The conveyor is flexibly attached to the hopper by means of a ball joint permanently riveted to the trough and fitting into clamps bolted to the back of the transfer hopper.

The transfer hopper is a large casting secured to the engine frame beneath the cab deck. Secured to the front on a pivot inside the hopper, and dividing the coal coming through the front trough opening, is a dividing rib which



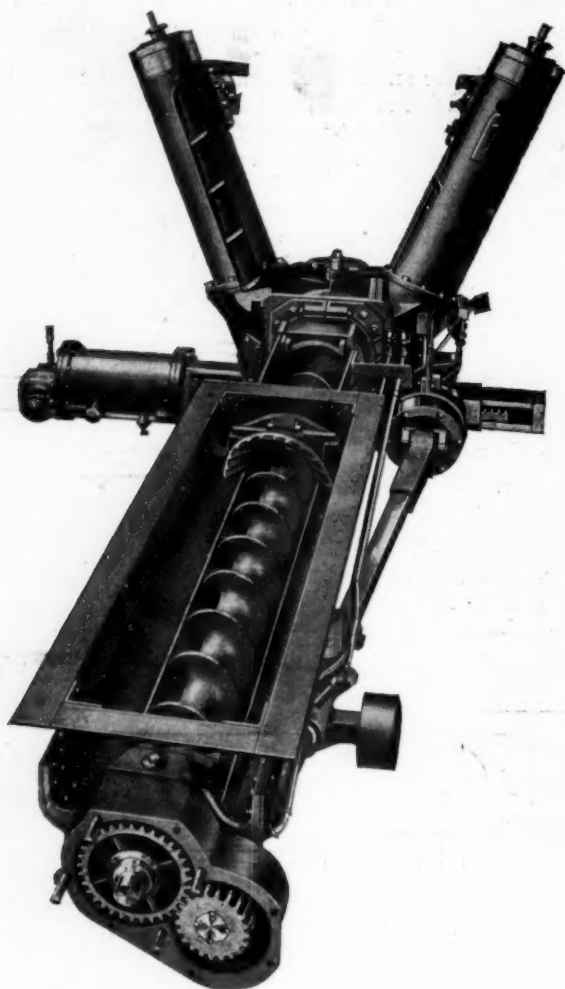
The Duplex Stoker as Applied to a Locomotive

vided equally or unequally according to the position of the adjustable dividing rib between the two elevators. In the elevator casings are screws which raise the coal and allow it to drop into tubes which are fitted into elbows and extend through holes in the backhead on each side of the firedoor. Constant steam jets in the elbows blow the coal through the tubes and distributors located on the inside of the firebox deflect and spread the coal over the entire surface of the fire.

can be operated through an opening in the cab deck. By turning this rib to the left or right the supply of coal to either of the vertical elevators may be controlled.

The spreading of the coal in the firebox is accomplished by means of the two firing points at the openings through the backhead of the boiler. The firedoor is left undisturbed so that it can be used for hand firing at the roundhouse and on sidings or when drifting. Two elbows, in which the firing nozzles are secured, are bolted to the elevator casing.

Distributors and tubes combined are attached to these elbows, the tubes extending through the openings in the backhead and the distributor, being on the inside of the firebox. The distributor tubes serve as a firing plate and the coal



**Exposed View of the Duplex Locomotive Stoker Detached from the Locomotive**

is blown through the tubes on to the underside of the distributor by jets of steam admitted to the firing nozzle. An intermittent action is secured through a constant steam jet

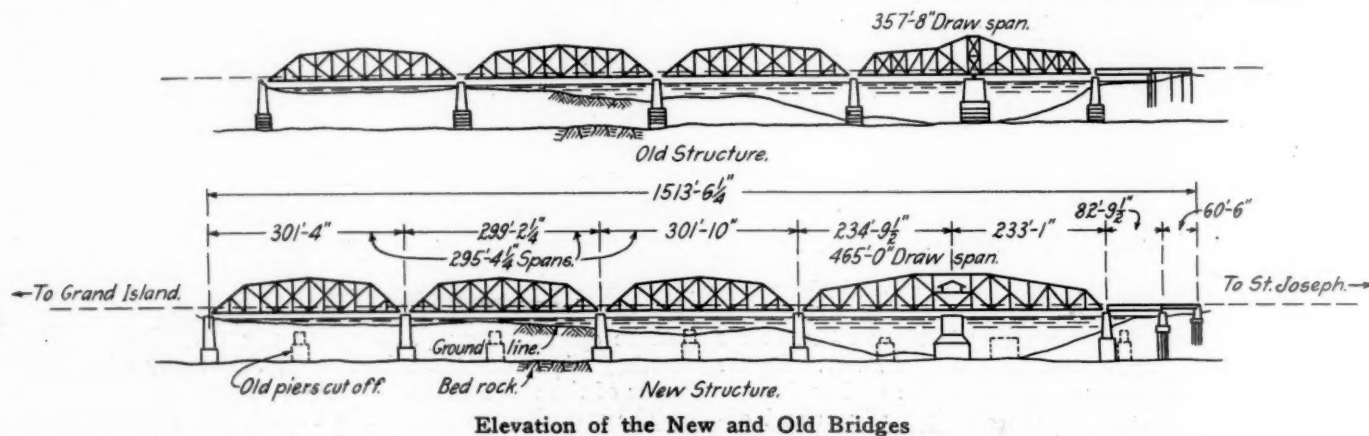
The driving engine consists of a cylinder of 11-in. bore with a  $17\frac{3}{4}$ -in. stroke, being provided with a hollow piston rod and a reverse head. It operates on from 8 to 80 lb. of steam according to the load. In normal operation the piston has a power stroke in one direction only, namely, when the piston is traveling towards the center line of the locomotive. The stroke is cushioned at either end by steam. It is so controlled that it may be stopped and reversed at any point of the stroke by moving the operating rod located on the back head of the boiler. A horizontal and vertical rack which meshes with pinions operating the conveyor mechanism and the vertical elevators, respectively, is connected directly to the piston. The inner cylinder head is cast integral with the housing which carries these racks. The conveyor driving shaft is provided with a universal joint and a slip joint to permit the necessary motion between the engine and tender. The operation of this shaft is controlled through three sets of pawls and a ratchet. In normal operation the horizontal rack driving the pinion operates the conveyor shaft in one direction only; on the reverse movement the pawls slide over the teeth in the ratchet wheel. There are three operations which are controlled by a shifter lever. The first is the drive, or normal operation, the second is neutral, and the third is the reverse operation. Thus the conveyor may be operated in either direction or may not be operated at all while the stoker engine is running. The vertical elevator screws are operated in similar manner. They have a bearing in the bottom of the transfer hopper and in the top of the elevator casing.

The pressure of steam on the steam jet under working conditions varies from 10 to 25 lb. The distribution is regulated by varying the pressure, which is indicated by a steam gage on the backhead of the boiler, and also by changing the position of the dividing rib. The amount of coal fed can be regulated by varying the speed of the engine. Stokers of this type have been operating successfully for several months and a large number have already been ordered for application to locomotives now under construction.

### RECONSTRUCTION OF THE ST. JOSEPH BRIDGE

The bridge of the St. Joseph and Grand Island, over the Missouri River at St. Joseph, Mo., is being reconstructed to provide a new substructure and a new draw span. The present bridge is a single track structure with highways supported on brackets outside of the trusses on each side.

The piers of the existing structure were built in 1872 and the superstructure was renewed on these same piers in 1904. It now develops that the substructure must be re-



and the stopping of coal elevation during the return stroke of the driving engine. Peep holes are provided through which the coal supply and the condition of the fire can be observed.

newed and, as a condition for granting authority for the reconstruction, the War Department of the United States Government insisted upon a longer drawspan, giving a clear channel opening of 200 ft. on each side. This necessitates a

new drawspan of greater length and the shifting of the fixed spans to make room for it.

The erection program is briefly as follows: A 70-ft. plate girder span will be modified to operate as a temporary bascule bridge between old pier 3 and new pier 2. When this has been installed underneath the existing drawbridge, the western portion of the old drawbridge steel will be removed and the temporary bascule raised and placed in operation, highway traffic during the reconstruction being carried on the railway track. The new drawbridge will be erected parallel with the stream, being cantilevered each way and the balance being maintained by temporary steel pile bents.

A temporary trestle will be constructed under the three fixed spans which will be supported on jacks resting on standard railway trucks. When the necessary work has been completed the three fixed spans will be rolled about 136 ft. to the west, the temporary bascule dropped, the east half of the old drawbridge moved down stream on temporary supports opposite the piers, and the new drawbridge swung into place. After this, the remaining portion of the old drawbridge will be removed.

The contract for the new substructure has been let to the Missouri Valley Bridge & Iron Company, Leavenworth, Kan., and work has already started. The substructure piers are being installed by the pneumatic-caisson process. The contract for the fabrication of the new drawbridge steel has been let to the American Bridge Company but the contract for its erection has not been awarded although bids have been asked and it is expected that the contract will be let in the near future.

It is expected that the substructure will be completed in the early fall and the entire reconstruction finished early in 1918.

## STATE OWNERSHIP FAILS IN SOUTH AMERICA

All the larger republics of South America at some time have tried government ownership of railways. Most of them have abandoned the policy as a failure. Why, is shown in an illuminating analysis of South American railways by Lionel Wiener, now appearing in the Railway Gazette of London, which is summarized as follows by the Bureau of Railway News and Statistics.

"One and all have shown the same results, owing mainly to the creeping in of politics in their management; too many employees that it has been deemed inadvisable to discharge; bad service and rolling stock that careless management has allowed to decay; construction of expensive unnecessary lines; costly exploitation, yielding an annual deficit."

Probably no quarter of the world so well as South America enables close comparison between state and private operation under similar conditions, sometimes the comparison being possible on one and the same railway. The Sobral Railway of Brazil, opened by the government in 1883, operated at a steady deficit up to October 31, 1897, when it was taken over by a private company. From the date of the transfer it has shown a handsome profit, the constant deficit having been turned to a profit even in the two months of 1897 remaining after the transfer. The Porto Alegre Railway of Brazil was operated by the government from 1883 to 1891 at a deficit. It was then taken over by a company which by 1904 had reduced the working percentage to 75.42 per cent.

Today the Central of Brazil is the principal Brazilian railway under government operation. For every \$100 of its revenues the expense of operation of this line rose from \$96.70 in 1907 to \$136.90 in 1911, dropping to \$126.20 in 1912. In 1908, while this government railway was spending \$105.50 to earn \$100 gross revenues, the three neighboring private railways spent respectively \$45.90, \$54.20 and \$56.30

for each \$100 revenue. The army of unnecessary employees is blamed for the state railway's persistent and growing deficits. "Such a system as the Central of Brazil is an excellent electioneering instrument in the hands of government," says the author, "and despite the annual deficit, not likely to be relinquished."

Chili has had a similar experience. Operating expenses of the Chilian State Railways rose from \$50 for each \$100 revenues in 1884 to \$164 for each \$100 revenues in 1907, dropping then to \$123 in 1911. Between the same years the Paulista Railway, the leading private company, increased its expenditures from \$41 to \$44 for each \$100 revenues, in one year reaching \$60, the highest attained, and in two other years falling to \$31. In 1907 and 1910 the Chilian state system contrasted as follows with the private railways in the amount spent for each \$100 gross revenues:

	1910	1907
State Railways .....	\$121	\$163
Tacna Arica .....	60	68
Iquique .....	47	47
Antofagasta .....	67	64
Taltal .....	54	61
Curanilahue .....	55	55
Paulista .....	45	41

Peru's record is even worse. After starting a number of costly lines the government defaulted and handed the system over for operation by the Peruvian Corporation.

Argentina, the only other South American country retaining any considerable mileage under government operation, contemplates leasing the greater portion to a private company. The northern lines cover 3,129 miles of the entire 3,482 miles government operated. A great portion of the country served is rich in sugar, maize, wine, etc., and "economically worked, there is little doubt these systems should yield fair returns. Yet their deficit has been almost continuous, which contrasts strongly with most other lines. Proposals for leasing them have been put forward and the adoption of some such step would be eminently sound."

Individual provinces of Argentina have had identical experiences. Of three provinces which have tried government ownership, two abandoned the system after a few years of deficits and handed the lines over to private companies.

**DOMINICAN CENTRAL RAISES FREIGHT RATES.**—The Dominican Central Railroad, which connects Puerto Plata with Santiago, a distance of 42 miles, with an extension to Moca of a further 17 miles, has raised its freight rates, effective June 18, from 10 to 25 per cent. The management has given as a reason for the increased freight rates the high cost of coal and other materials required by the railroad company.

**AUSTRALIAN RAILWAY FINANCE.**—It has been found necessary by the Victorian Government to engage the services of an English expert to investigate the cause of the unfavorable financial condition into which the railways of that state have lapsed. The operations of the New South Wales railways each year, for the past five years, have shown a more alarming set-back, with indications of a greater deficiency in the near future, although the traffic has been above all previous records. The results have been as follows: For the year 1911 810,948,779 ton-miles of freight and 11,915,500 passengers were carried, which realized on the railway transactions a surplus of £553,998 (\$2,692,430). This traffic increased year by year until, by the year 1916, it had reached a total of 1,028,760,304 ton-miles of freight, and 31,931,210 passengers, equivalent to an all-round increase of over 25 per cent, yet a loss of £777,747 (\$3,779,850) resulted, compared with the operations of 1911. During this period capital expenditure was increased by £17,853,698 (\$86,768,972) and £1,500,275 (\$7,291,337) extra was paid in wages—for operating the traffic—for the year 1916 to that paid in 1911.

# General News Department

The American Association of Demurrage Officers has decided to hold no convention this year.

The Illinois Central has granted an increase in pay of seven per cent to its clerical employees, effective July 1.

The Missouri Pacific has granted an increase of five cents an hour to members of the shop crafts employed on the road.

The list of roads which reported subscriptions of Liberty Bonds to the Liberty Loan Committee of Railroads, as noted in last week's issue, did not include the name of the Evansville & Indianapolis. On that road 74 individuals subscribed for \$5,750 in bonds.

Edward Chambers, vice-president of the Atchison, Topeka & Santa Fe, in charge of traffic, has been appointed an assistant to H. C. Hoover, food administrator at Washington, and will act in an advisory capacity with reference to transportation matters in connection with the campaign for food conservation.

The New York, New Haven & Hartford, which has taken off 199 passenger trains, is thereby saving, each week, 2,054 tons of coal, equal to an annual saving of 106,828 tons. As two tons of coal will warm a family of five persons a long time, it is estimated that by reason of this economy of train service nearly 270,000 persons could be kept comfortable during the coming winter.

The acute shortage of freight cars has caused the Tennant-Oakland Automobile Company, Pontiac, Mich., to organize the Tennant-Oakland Transportation Company, to provide adequate means of fulfilling delivery contracts, and to supply the demand for Oakland automobiles in Chicago. The company has bought 40 freight cars, which are now being used between the factory at Pontiac and the branch in Chicago.

The Lehigh Valley on postcards mailed to consignees advising them of the arrival of freight, prints on the address side of the card in red type the following: "These are war times. We are doing everything in our power to handle the country's business. You can do your bit by moving the freight referred to in this notice just as soon as possible." Agents will supplement these notices with personal appeals whenever possible.

As the result of a movement instituted by employees of the Chicago Great Western, \$1,640 was recently collected and sent to the Great Western company of the Third Reserve Engineers, now stationed in Chicago, to provide greater comforts for the men. R. B. Parrott, passenger conductor, was chairman of the employees' committee which handled the contributions, and George Bristow, assistant general passenger agent, Chicago, was secretary.

The Chicago Car Interchange Committee has opened an office in the Transportation building, Chicago, with D. I. Forsyth, general car accountant of the Wabash, in charge. The committee is one of a number of bureaus which have been organized in all the large traffic centers of the country to assist the Commission on Car Service of the American Railway Association in bringing about the greatest transportation efficiency possible on the part of both the railroads and shippers.

The University of Louisville (Ky.) announces the opening, July 20, of a school for training telegraph operators for the Government Signal Corps. The Louisville & Nashville Railroad joins with the university in furnishing the equipment, and the school has been established at the request of the War Department. Candidates must be men between 18 and 31 years of age, and they must have no dependents. Women may attend the school for the purpose of preparing themselves to take the place of men who may be called into the national service.

Henry J. Horn, formerly vice-president of the New York, New Haven & Hartford, is one of the 12 members of the Red Cross Commission now on its way to Russia. The commission is carrying with it a quantity of urgently needed supplies and

surgical instruments, and will study conditions so as to ascertain how the American Red Cross can extend most effective relief. In co-operation with the American Railroad Commission already in Russia, the Red Cross Commission will study the problem of transportation, especially with reference to making sure that shipments of relief supplies may reach their destination without delay.

Committee meetings of the American Association of Railroad Superintendents were held at the Hotel Sherman, Chicago, on July 1 and 2. The Committee on Arrangements considered the matter of charges for spotting cars on private sidetracks. The Committee on Membership considered the following subjects: Elimination of overs and shorts; how to develop a more wholesome feeling of the public towards the railroads; and yard operation. The Arbitration Committee discussed the following subjects: How to get a better feeling from the public, thereby obtaining their assistance in loading and releasing equipment; handling of live stock to comply with federal law; railroad and highway grade crossing protection; and the inadvisability of handling carload freight on card billing.

## Special Agents Convention Postponed

The International Association of Railway Special Agents and Police, which was to have held its annual convention at Omaha, Neb., on June 25, 26 and 27, did not convene on account of the war emergency. The annual meeting of the American Association of Freight Agents, scheduled to take place at Denver, Colo., on June 19, 20, 21 and 22, was also indefinitely postponed on account of the war.

## United Railways of Yucatan

These lines are now a part of the Mexican Government railways, the government having acquired all of the stock of the company.

These railways were some time ago taken over by the government of the state of Yucatan from their private owners, and the name changed to the Constitutionalist Railways of Yucatan. The owners of the property are quoted as saying that they were practically forced to sell their stock to the Federal government. This system of railways covers not only the Peninsula of Yucatan, but extends also to the city of Campeche in the state of that name. It has a total length of about 530 miles.

## New Santa Fe Bonus

E. P. Ripley, president of the Atchison, Topeka & Santa Fe, announced on July 1, that employees in the service of the road on December 31, 1917, will be paid an additional compensation equal to 10 per cent of their salary or wages for the second six months of the calendar year. The following employees are excepted: Those working under schedules or contracts made by collective bargaining, those whose pay equals or exceeds \$5,000 per annum, or whose total compensation for the six months in question is over \$2,500; those whose rate has been increased or who are employed during the six months' period, with the understanding that the additional payments will not be made to them.

## Sir John A. F. Aspinall

John Audley Frederick Aspinall, general manager of the Lancashire & Yorkshire, is now a knight, that honor having been conferred on him by King George on his last birthday. Mr. Aspinall is a member of the Railway Executive Committee now managing the railways under the war regime. He was born in 1851. He was educated at Beaumont college, Berkshire, and his first railway service was in the shops of the London & Northwestern at Crewe. From 1875 to 1886 he was a shop superintendent on the Great Southern & Western of Ireland. In the last named year he went to the Lancashire & Yorkshire as chief mechanical engineer and he has been with that company ever since. The ex-

tensive shops of that company, at Horwich, were laid out under his supervision. He was appointed general manager in 1899. In 1907 he was chairman of the general manager's conference at the Railway Clearing House, and in 1909-1910 he was president of the Institution of Mechanical Engineers.

#### Prompt Release of Cars

At the Steelton plant of the Bethlehem Steel Company, Steelton, Pa., in the month of June, 7,690 loaded cars were received from the Pennsylvania and the Philadelphia & Reading railroads, and almost one-half of them were on the tracks of the Steel company less than 24 hours each. This company's demurrage bills are paid under the average agreement, and the record for June shows a surplus of 822 credits. There were no non-cancelable debits. The number of cars unloaded and returned within one day was 3,719. The cars are taken by the engines of the Steel company outside the plant, and these engines do all the spotting. The plant is about  $3\frac{1}{2}$  miles long.

#### The Mexican Railway

This railroad, which is a British-owned property, is to be rehabilitated and placed in full control of the operating company, according to the announcement of B. E. Holloway, of London, England, who has just arrived in the City of Mexico. Mr. Holloway is director general of the railroad, and he has come to Mexico with full authority to act for the stockholders. The road extends from the capital to Vera Cruz, a distance of 264 miles, and has several branch lines with an aggregate length of about 185 miles. Mr. Holloway has held the position of secretary of the company, with headquarters in London, for several years, and his appointment as director general is expected to be followed by his removal to the City of Mexico. This road has suffered heavy damages at the hands of revolutionists and bandits during the last six years, and a large claim for losses has been presented to the government. Some time ago the property was taken over by the Carranza authorities, and it is still operated by the government, with Pauline Fontes as general manager. It is understood that as soon as the road is turned back to its owners, Walter Morcom will resume his former position as general manager. Long stretches of track and many bridges will have to be rebuilt. The rolling stock has also been greatly depleted during the long revolutionary period. The English-built sleeping cars that the line owned and operated are now scattered all over Mexico, a number of them being used as private movable homes of army officers.

#### I. C. C. Establishes Division on Car Service

The Interstate Commerce Commission announced on Thursday the creation of a division on car service to administer the authority over matters pertaining to car service given to the commission by the Esch-Pomerene law, which was passed by Congress in May. E. H. De Groot, Jr., formerly superintendent of transportation of the Chicago & Eastern Illinois, who will work in the exclusive employ of the Interstate Commerce Commission is to be the chief of the division. With August G. Gutheim, the examiner of the commission, who has been representing the commission in co-operation with the Commission on Car Service, he will take immediate charge of its organization and operation. H. C. Barlow, traffic director of the Chicago Association of Commerce and chairman of the executive committee of the National Industrial Traffic League, will collaborate with the division during its formative period. Chairman Hall, of the Interstate Commerce Commission held a conference with the Commission on Car Service on Wednesday and outlined to them the plans of the commission. The Interstate Commerce Commission has also announced that through the new division it will regulate car service and where occasion requires will issue orders to carriers, but that it will as far as practicable avail itself of co-operative efforts on the part of the railway committee.

The Esch-Pomerene law extends the jurisdiction of the commission over the movement, distribution, exchange, interchange and return of cars, requires the carriers to establish, observe and enforce just and reasonable rules, regulations and practices with respect to car service and the commission is empowered in its discretion to require them to file these rules and regulations in the same manner that tariffs are filed. The commission is also empowered to establish car service rules and, whenever it shall be of the opinion that necessity exists for immediate action, is

given emergency powers to suspend existing rules and to make such just and reasonable directions with respect to car service as it deems in the public interest. The law provides that the directions of the commission as to car service may be made through and by such agents or agencies as the commission shall designate and appoint for that purpose and penalties are provided for non-compliance.

Mr. De Groot was born March 22, 1871, at Galesburg, Ill., and has been in railroad service since May 13, 1886, beginning as office boy in the general freight department of the Chicago, Burlington & Quincy. After holding various positions in the office, train and yard service of the Burlington and the Chicago & Eastern Illinois, he became trainmaster of the latter road in 1902, and has since been successively division superintendent, superintendent and track supervisor, superintendent of the St. Louis division and terminals, and since November 16, 1912, superintendent of transportation of the Chicago & Eastern Illinois at Chicago.

#### Wires May Be Commandeered

The long pending controversy between the Louisville & Nashville Railroad and the Western Union Telegraph Company, in which the railroad seeks to compel the telegraph company to take its poles off the railroad right of way, was the subject of hearings before the Federal Court at Louisville, Ky., last week. The telegraph company presents evidence to show that the construction of new lines in the state of Alabama—the lines within that state are the ones which are now the subject of controversy—would require a long time, and also that the destruction of the existing poles and wires at this time would seriously interfere with the operations of the government on the Gulf Coast. There is a large volume of government messages to and from Mobile and Pensacola. The railroad company, on the other hand, produces affidavits to show that the telegraph business could be conducted with satisfaction to the government without using the wires along the Louisville & Nashville.

Attorney-General Gregory has written a letter to the judge of the court intimating that the government will not put up with any interruption of service, and it is understood that if there should be a prospect of disturbance of the regular currents of telegraph traffic, the government would seize the lines.

The lawyers for the Western Union asked the court to appoint a commissioner to determine how long the telegraph company could occupy the railroad premises, and what compensation should be paid to the railroad company.

The judge reserved decision and intimated that his opinion would not be handed down until September.

#### Trolley Car Accidents

In the derailment of a southbound passenger car on the Niagara Gorge Railroad, near Suspension Bridge, N. Y., on the afternoon of July 1, ten passengers and one employee were killed, and 26 persons were injured. A number of the victims fell into the Niagara river, and it is supposed that some were carried down stream and lost. The cause of the derailment was a weakening of the road bed. The car was moving at the rate of about 20 miles an hour.

In a butting collision of trolley cars near Monongahela, Pa., on July 2, making a bad wreck, which was run into within a few minutes by a work car, about 80 persons were injured, four of them fatally.

At Manistee, Mich., on the 4th of July, two persons were killed and 20 were injured, four of the latter fatally, when a street car was run into at a crossing by an excursion passenger train of the Manistee & North Eastern. It is said that the street car approached the crossing at uncontrollable speed, on a descending grade, having attached to it two heavy steel trailers.

In a butting collision of electric cars near Heisley, Ohio, on the 5th of July, eight passengers and a motorman were injured.

Near Youngstown, Ohio, on the 5th, a trolley car was derailed because, it is said, the brakes failed, and one passenger was killed and 20 injured. The wreck caught fire, and some of the passengers were rescued from the flames with difficulty.

At Stryker, Ohio, on the 5th, a rear collision of interurban cars resulted in the injury of 14 persons.

Near Michigan City, Ind., on the evening of the 4th, a trolley car, which was running at high speed, left the tracks on a curve and was overturned. Twenty persons were injured.

# REVENUES AND EXPENSES OF RAILWAYS

## FOUR MONTHS OF CALENDAR YEAR, 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of way and structures.	Equip. and other.	Traffic.				
Kanawha & Michigan.....	177	\$827,511	\$116,238	\$943,749	\$297,505	\$10,813	\$312,932	\$796,586	\$29,272	\$117,634	\$232,253
Kansas City, Mexico & Orient of Texas.....	466	344,701	62,328	407,029	81,375	98,024	226,155	439,664	\$68,000	\$185,654	\$185,654
Kansas City Southern.....	466	344,701	62,328	407,029	81,375	98,024	226,155	439,664	\$68,000	\$185,654	\$185,654
Kansas City Terminal Co.....	837	3,334,401	528,112	3,862,513	420,553	51,881	1,094,454	2,519,664	20,500	29,774	1,805
Kansas City Terminal Co.....	24	2,744,817	209,253	2,954,070	259,167	424,833	52,352	1,036,698	107,000	665,696	19,409
Kansas City Terminal Co.....	900	2,744,817	209,253	2,954,070	259,167	424,833	52,352	1,036,698	107,000	665,696	19,409
Kansas City Terminal Co.....	97	1,000,330	131,063	1,131,393	137,466	70,034	323,477	477,928	38,340	334,101	74,776
Lake Erie & Western.....	296	1,246,775	1,331,063	2,577,838	1,778,024	286,087	36,197	1,147,649	655,000	2,045,054	1,415,395
Lehigh & Hudson River.....	1,442	1,340,339	2,302,978	3,643,317	622,698	431,928	131,278	1,147,649	294,183	357,802	181,614
Lehigh Valley.....	397	1,340,339	2,302,978	3,643,317	622,698	431,928	131,278	1,147,649	294,183	357,802	181,614
Long Island.....	1,154	2,566,415	994,301	3,560,716	431,928	608,215	131,278	1,147,649	294,183	357,802	181,614
Los Angeles & Salt Lake.....	302	362,223	100,146	462,369	88,070	82,214	26,056	279,124	13,984	1,196,698	21,601
Louisiana & Arkansas.....	342	586,023	69,501	655,524	109,702	130,633	532,356	7,677,306	4,970	13,984	58,567
Louisiana Ry. & Navigation Co.....	208	754,378	273,240	1,027,618	284,455	4,233,436	19,597	214,888	33,977	396,691	1,233,496
Louisiana Western.....	5,070	17,023,652	4,603,549	21,627,201	91,472	667,453	42,818	2,049,169	4,388	719,481	1,233,496
Louisville & Nashville.....	200	498,616	134,111	632,727	494,326	2,501,222	261,988	7,677,306	4,970	13,984	58,567
Louisville, Henderson & St. Louis.....	1,216	3,031,394	3,518,888	6,550,282	1,684,363	1,791,929	11,454	231,072	348	87,824	1,414,148
Maine Central.....	1,862	10,738,066	176,964	10,915,030	846,933	171,926	1,767	80,229	64,149	260,404	33,361
Michigan Central.....	385	635,795	11,492	647,287	395,863	80,229	71,945	1,427,455	21,630	10,744,665	1,942,652
Midland Valley.....	1,647	2,503,048	554,105	3,057,153	452,992	363,079	197,074	3,842,865	86,161	29,842	735
Minneapolis & St. Louis.....	4,228	6,896,341	1,974,541	8,870,882	993,226	1,504,954	15,591	2,651,883	1,269	28,941	11,309
Missouri, Kansas & Texas System.....	3,365	310,769	122,561	433,330	2,461,049	93,729	2,461,049	93,729	2,461,049	93,729	2,461,049
Missouri, Oklahoma & Gulf of Texas.....	3,365	310,769	122,561	433,330	2,461,049	93,729	2,461,049	93,729	2,461,049	93,729	2,461,049
Missouri Pacific.....	108	615,421	82,207	697,628	687,354	123,002	123,002	123,002	123,002	123,002	123,002
Monongahela Connecting.....	401	1,469,132	435,301	1,904,433	2,047,482	77,613	9,978	7,049	30,727	252,639	80,223
Monongahela Connecting.....	1,237	3,257,437	987,366	4,244,803	1,697,332	1,853,770	152,315	1,443,146	1,073,342	1,740,548	54,372,779
Morgan La. & Tex. R. & S. S. Co.....	165	971,737	50,300	1,022,037	47,512	104,101	1,022,037	47,512	1,022,037	47,512	1,022,037
Nashville, Chattanooga & St. Louis.....	204	1,501,091	205,119	1,706,210	1,477,628	160,371	263,107	41,874	22,222	47,956	374,416
New Orleans & North Eastern.....	285	333,406	89,754	423,160	222,443	77,613	9,978	7,049	30,727	252,639	80,223
New Orleans Great Northern.....	6,083	44,285,466	16,371,294	60,656,760	70,480,053	7,119,441	13,290,765	1,021,431	1,073,342	1,740,548	54,372,779
New Orleans, Texas & Mexico.....	570	4,684,246	351,553	5,035,800	2,330,451	2,330,451	483,369	33,805	1,178,163	21,802	53,869
New Orleans, Texas & Mexico.....	1,907	1,817,574	311,078	2,128,652	2,548,656	3,020,072	3,020,072	3,020,072	3,020,072	3,020,072	3,020,072
New York, Chicago & St. Louis.....	112	1,201,085	173,557	1,374,642	1,499,208	190,729	134,374	253,246	34,330	5,784,322	41,874
New York, New Haven & Hartford.....	135	806,936	190,195	997,131	1,116,413	94,609	134,374	253,246	34,330	5,784,322	41,874
New York, Ontario & Western.....	2,085	1,311,318	354,475	1,665,793	1,838,920	210,613	210,613	210,613	210,613	210,613	210,613
New York, Philadelphia & Norfolk.....	908	1,311,318	354,475	1,665,793	1,838,920	210,613	210,613	210,613	210,613	210,613	210,613
Norfolk & Western.....	6,513	19,551,349	4,222,332	23,773,681	26,004,455	3,020,072	3,020,072	3,020,072	3,020,072	3,020,072	3,020,072
Norfolk Southern.....	507	608,004	501,161	1,109,165	1,256,216	259,658	189,233	189,233	189,233	189,233	189,233
Norfolk Southern.....	114	284,347	89,816	374,163	414,112	97,329	1,059,777	143,984	2,880,713	569,506	10,984,776
Northwestern Pacific.....	2,052	6,642,437	1,577,708	8,220,145	8,901,319	938,609	694,783	185,020	569,506	10,984,776	10,984,776
Oahu Railway & Land Co.....	2,052	6,642,437	1,577,708	8,220,145	8,901,319	938,609	694,783	185,020	569,506	10,984,776	10,984,776
Oregon Short Line R. & Nav. Co.....	1,755	15,416,933	4,038,525	19,455,458	21,740,774	2,786,581	16,042,193	339,584	10,984,776	10,984,776	10,984,776
Panhandle & Santa Fe.....	4,519	55,224,901	15,031,480	70,256,381	78,151,330	10,423,936	16,042,193	339,584	10,984,776	10,984,776	10,984,776
Pennsylvania Railroad.....	1,127	16,939,027	2,278,648	19,217,675	20,603,673	1,150,242	3,597,572	186,254	8,780,349	53,833	346,517
Pere Marquette.....	718	4,421,339	3,668,622	8,089,961	9,202,044	1,270,404	1,805,695	117,964	4,016,139	786	236,693
Philadelphia & Reading.....	225	1,311,318	354,475	1,665,793	1,838,920	210,613	210,613	210,613	210,613	210,613	210,613
Philadelphia, Baltimore & Washington.....	2,399	16,304,950	4,024,356	20,329,306	22,129	586,199	30,653	42,537	155,955	36,742	16,027
Pittsburgh, Lake Erie, C. & St. Louis.....	21	734,479	589,392	1,323,871	1,514,902	126,012	162,343	237,638	88,534	39,232	405,711
Pittsburgh, Shawmut & Northern.....	88	768,754	374,751	1,143,505	1,259,046	197,240	197,240	197,240	197,240	197,240	197,240
Port Reading.....	258	622,005	517,565	1,139,570	1,337,667	1,950,344	2,190,441	300,395	3,993,232	46,564	266,947
Richmond, Fredericksburg & Potomac.....	3,339	9,764,288	2,610,324	12,374,612	13,377,667	1,950,344	2,190,441	300,395	3,993,232	46,564	266,947
Rutland & Grand Island.....	9	1,927,417	4,205,141	6,132,558	6,132,558	2,560,31	56,031	312,692	1,641,641	1,641,641	1,641,641
St. Joseph & Brownsville & Mexico.....	4,752	11,927,417	2,979,749	14,907,166	17,411,933	3,777,408	3,777,408	3,777,408	3,777,408	3,777,408	3,777,408
St. Louis, Iron Mountain & Southern.....	244	2,927,007	521,102	3,448,109	3,677,473	312,692	63,725	431,061	716,505	716,505	716,505
St. Louis, San Francisco & Texas.....	811	1,186,921	311,840	1,498,761	1,625,015	272,180	431,061	716,505	716,505	716,505	716,505
St. Louis, San Francisco & Texas.....	811	1,186,921	311,840	1,498,761	1,625,015	272,180	431,061	716,505	716,505	716,505	716,505
St. Louis, Southwestern of Texas.....	811	1,186,921	311,840	1,498,761	1,625,015	272,180	431,061	716,505	716,505	716,505	716,505
St. Louis Southwestern of Texas.....	811	1,186,921	311,840	1,498,761	1,625,015	272,180	431,061	716,505	716,505	716,505	716,505

\* Reorganized on April 1, 1917. No cumulative figures shown.

## REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF CALENDAR YEAR, 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Equip-ment.	Traffic.	Trans-portion.	Miscel-laneous.				
San Antonio & Aransas Pass.....	726	\$793,986	\$264,871	\$1,058,857	\$280,532	\$208,887	\$27,670	\$602,582	.....	\$1,174,381	\$60,000	—\$77,732	\$66,244
Seaboard .....	3,461	6,869,602	2,341,312	9,210,914	1,080,497	1,485,349	32,432	3,728,530	.....	3,297,680	429,989	2,863,786	14,546
Southern .....	6,983	18,437,829	6,076,391	24,514,220	3,164,103	4,209,974	679,433	9,338,111	.....	8,700,945	1,175,124	7,513,721	362,389
Southern in Mississippi.....	281	219,062	115,607	334,669	95,229	36,164	9,344	169,518	.....	43,814	39,206	4,575	—3,142
Southern Pacific .....	7,079	28,650,686	9,909,765	38,560,451	4,551,388	6,100,581	15,641,616	15,641,616	674,737	13,557,925	2,221,731	11,325,508	2,169,428
Spokane, Portland & Seattle.....	555	1,322,974	440,037	1,763,011	212,561	166,794	29,818	413,721	17,164	996,762	231,490	764,994	470,469
Staten Island Rapid Transit Co.....	24	226,682	189,578	416,260	53,175	58,396	4,380	215,571	.....	86,571	24,000	62,571	—42,563
Tennessee Central .....	295	385,504	116,716	502,220	90,492	83,557	19,231	205,291	.....	119,357	19,200	100,146	30,436
Terminal R. R. Ass'n of St. Louis.....	37	1,542	1,115,725	1,117,267	112,097	67,574	3,898	366,491	9,171	574,339	23,717	417,642	—64,502
Texas & New Orleans.....	468	1,371,860	426,647	1,798,507	209,557	318,955	36,990	645,526	51,274	1,307,586	84,600	575,159	396,227
Texas & Pacific.....	1,947	4,687,359	1,727,025	6,414,384	816,633	888,661	138,873	3,003,072	49,181	232,534	320,000	1,464,844	201,324
Toledo & Ohio Central.....	436	1,769,602	185,833	1,955,435	293,325	451,575	28,491	959,007	6,859	1,781,086	100,173	1,714,600	—97,511
Toledo, Peoria & Western.....	248	234,446	135,395	369,841	69,569	108,703	9,250	160,886	.....	291,237	30,000	—873	—5,221
Toledo, St. Louis & Western.....	451	1,898,394	112,246	2,010,640	341,816	346,628	71,230	756,984	.....	559,579	77,000	482,384	—81,767
Trinity & Brazos Valley.....	361	246,430	37,957	284,387	107,207	127,402	11,226	165,610	.....	134,254	20,640	—154,899	—35,636
Ulster & Delaware.....	129	119,968	49,086	169,054	32,904	44,185	4,756	116,980	1,461	24,186	16,000	8,230	—43,234
Union Pacific.....	3,622	15,270,547	3,496,149	18,766,696	2,741,654	2,997,389	436,850	6,805,854	413,085	6,872,003	1,289,400	5,581,276	—2,264,834
Union R. R. of Baltimore.....	8	527,321	136,989	664,310	32,377	.....	.....	27,117	.....	594,808	29,629	565,180	70,868
Union R. R. of Pennsylvania.....	31	.....	.....	1,541,050	116,615	542,725	509	908,538	.....	49,670	29,342	—79,012	—33,002
Vicksburg, Shreveport & Pacific.....	171	423,748	166,231	589,979	71,556	107,556	18,336	209,450	7,012	230,370	42,625	187,745	76,383
Virginian .....	513	2,836,074	148,213	2,984,287	246,857	478,166	22,693	931,180	58,514	1,359,046	141,000	1,218,023	—66,578
Wabash .....	2,519	9,168,108	2,149,361	11,317,469	1,129,402	1,712,576	386,646	5,233,234	70,886	3,560,160	405,818	3,152,595	—229,845
Washington Southern .....	36	249,455	343,233	592,688	54,474	80,391	6,289	257,292	8,375	348,594	22,610	325,961	76,277
West Jersey & Seashore.....	359	844,078	1,164,631	2,008,709	480,917	370,090	44,465	1,121,017	14,206	2,103,856	159,666	—69,264	—202,374
Western Maryland .....	775	3,566,789	297,585	3,864,374	459,039	743,638	88,295	1,524,124	43,197	1,928,851	146,000	1,046,851	—26,238
Western Pacific .....	958	2,109,166	377,669	2,486,835	400,761	280,350	80,295	838,208	41,654	915,323	165,260	750,022	137,375
Western Ry. of Alabama.....	133	283,156	169,478	452,634	61,889	99,255	26,325	163,413	8,880	127,780	24,341	103,439	25,135
Wheeling & Lake Erie.....	512	2,281,839	203,222	2,485,061	317,819	457,819	32,505	1,032,393	6,755	772,900	173,283	599,617	—292,692
Yazoo & Mississippi Valley.....	1,382	3,971,690	1,028,044	4,999,734	917,394	882,127	85,969	1,787,339	9,402	1,514,796	415,933	1,097,742	103,196

\* Succeeded by Pittsburgh &amp; West Virginia as of April 1, 1917.

## Railway Wages in England

The last increase of wages of employees on the railways of Great Britain, which is based on an agreement reached without any stoppage of work, or even a threat of stoppage by any responsible leader, will mean an addition to the payrolls of \$30,000,000 a year. It was understood that the government, which guarantees the railways a certain income, would shoulder the entire responsibility for the additional expense. The wages of male employees over 18 years of age have been increased now four times since the beginning of the war, the first increase having been granted on February 15, 1915. For those earning over 30 shillings a week, the increases have been 2 shillings, 3 shillings 5 and 5 shillings, or a total of 15 shillings. Those receiving under 30 shillings a week, have also received a total advance of 15 shillings, though it did not come in exactly the same installments. Male employees under 18 years have received a total of 7 shillings 6 pence; female employees over 18 years, 5 shillings 6 pence; and under 18 years, 2 shillings 9 pence. The females received no advance until September 16, 1916.

## California Petroleum

The committee on petroleum of the California State Council of Defense has made a report to the governor, proposing plans for averting the threatened shortage in California petroleum. These plans include the immediate drilling of wells in disputed territory, the exemption from military service of skilled workmen in the oil fields, the utilization of powdered coal, natural gas, hydro-electric power and other sources of energy wherever possible and improved correlation between the oil companies, the oil pipe lines, the steamship companies and the railroads. The members of the committee (appointed by the governor in May) are: Max Thelen (chairman), Eliot Blackwelder and David M. Folsom. Mr. Thelen is the president of the California Railroad Commission.

The committee finds that production is falling behind consumption at the rate of 35,860 barrels a day, and at the present rate of consumption the entire available storage supply in California will be exhausted by June 1, 1919. Manufacturers of oil well supplies and the railroads are called upon to expedite the production and transportation of oil well casing, drill stems, wire cables and similar material. It is recommended that lands in litigation be developed either through federal receivers or through the claimants to the lands, with due regard to the rights of all parties; and that additional lands be thrown open for development by the federal government.

California petroleum plays a vital part in commerce and industry far beyond the boundaries of the state, and it supplies the Pacific Coast fuel requirements of the United States Navy and Army. The report says:

"At the present rate of production by Kern Trading & Oil Company, the Southern Pacific Company's fuel oil bureau, bearing in mind also the purchases of fuel oil by the Southern Pacific, including 1,000,000 barrels bought from Union Oil Company and not as yet drawn on, and bearing in mind also the Southern Pacific's consumption of fuel oil, the Kern company's storage of fuel oil will be exhausted by December, 1917, unless the recently initiated additional drilling operations shall increase the Southern Pacific Company's production, and unless the Southern Pacific converts to coal those portions of its system which are located in proximity to the coal fields of Washington, the Rocky Mountain states and New Mexico.

"Coal cannot be substituted for California fuel oil to any substantial extent during the war because of present difficulties in the production and transportation of coal. Approximately 1,000,000 barrels of California fuel oil will be saved in the ensuing year in the Northwest by the substitution of coal for California fuel oil by the Oregon Short Line and other industries. The Los Angeles & Salt Lake and the Western Pacific are converting a portion of their systems in Utah and Nevada from California fuel oil to coal produced in the Rocky Mountain states. The Southern Pacific and the Atchison, Topeka & Santa Fe can also gradually convert from fuel oil to coal those portions of their systems which are in proximity to the coal fields of the Northwest, the Rocky Mountain states and New Mexico.

"The legislature of California has declared that oil pipe lines are common carriers, and the question whether the statutes are constitutional has been submitted to the Supreme Court of the state of California. If the legislation is sustained the railroad

commission will have authority to supervise the lines so that they may be operated to their greatest efficiency from the point of view of the entire transportation situation. If the jurisdiction of the railroad commission is not sustained, some other means must be provided, so that the oil pipe lines may be operated to full efficiency in the present emergency.

"A more efficient correlation of the use of oil pipe lines, railroad tank cars and tank steamers would result in the release of a considerable number of railroad tank cars, which are badly needed to serve the industrial needs of California and neighboring states. The Standard Oil Company reports that it is 3,500 tank cars short at its refinery at El Segundo, and that it is accordingly unable to fill urgent orders from the copper mines of Arizona."

#### The Western & Atlantic

The Western & Atlantic Commission, appointed by the legislature of Georgia, has made a report to the legislature giving its conclusions concerning the Western & Atlantic Railroad, of which the Nashville, Chattanooga & St. Louis has taken a new lease to date from December, 1919. The commission recommends that the State, as owner of the railroad, shall maintain continued engineering supervision of the road and that an engineer be regularly employed. Recommendation is also made for a fixed appropriation for a secretary; and the commissioners have allowed themselves salaries of \$100 a month each, except for two members, the governor and the chairman of the railroad commission, who serve without salary. The special attorney of the commission is allowed \$5,000 salary for the year 1916. The total cost of the road and equipment, from the beginning to the date of the first lease, was \$6,275,000. Since the state first acquired its ownership, 75 years ago, no property additions have been made to the railroad; but, on the other hand, valuable terminal properties have been disposed of, both in Atlanta and Chattanooga; also at other points on the line. It is estimated that to reproduce the road today would cost \$15,508,867. The commission is of the opinion that a second main track will have to be built before the expiration of the new lease, and in connection with that improvement it will also be necessary to revise curves and grades. The estimated cost of the double tracking, bridge work, etc., contemplated by the report, is \$3,775,000. As to certain real estate in Chattanooga not now used by the lessee, the commission is convinced that sooner or later it will all be needed for railroad purposes. Two parcels of this property, worth around \$200,000, have not been included in the new lease. Certain proposals for the acquisition of property and changing location of terminals in Atlanta are rejected.

The commission presents a statement to justify its action in executing a new lease at this time, rather than to incur further delay. The general railroad situation, the prospects of federal legislation of unknown effect, and the reasonable interests of the lessee are the main factors.

The proposal to build an extension of the state road, from Atlanta eastward to the sea, is dismissed as unwise. Such a line would involve economic waste and it would not prove to be a material factor in the control of freight rates.

#### The Engineering Council

On June 27 was held the first meeting of the Engineering Council. This body is a department of the United Engineering Society, and has recently come into being as a medium of co-operation between the four national engineering societies. The function of the council may perhaps best be described by the following extract from the by-laws of the United Engineering Society: "The council may speak authoritatively for all member societies on all public questions of a common interest or concern to engineers." The council is composed of 24 members, five being appointed by each of the four founder societies, and four by the United Engineering Society.

At the organization meeting held in the rooms of the American Society of Mechanical Engineers on June 27 the following officers were elected: President, I. N. Hollis; vice-presidents, H. W. Buck and George F. Swain; secretary, Calvert Townley; executive committee, the four officers named with J. Parke Channing and D. S. Jacobus.

The council discussed at length ways and means by which the founder societies through the council may be of use to the

nation. The unanimous desire to help the government in the prosecution of this war resulted in a resolution instructing the executive committee to co-operate with the government in procuring the services of engineers, also the appointment of a committee of three consisting of H. W. Buck, A. M. Greene, Jr., and Edmund B. Kirby, to consider the best means of utilizing the inventive ability of members of the founders' societies.

The secretary was instructed to inform all government bureaus that might be interested in the organization of the engineering council and its desire to be of assistance.

### MEETINGS AND CONVENTIONS

*The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.*

- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 11-13, 1917, Washington, D. C.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3rd Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.
- INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.
- RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

## Traffic News

The Southern Railway has already begun running passenger trains daily between Louisville, Ky., and the cantonment which is being established by the War Department south of that city.

The Baltimore & Ohio reports that in the month of May the company's four limited trains between New York and Chicago, Nos. 5, 6, 7 and 8, arrived at final destination on time 98 per cent of their trips. Through freight train, No. 97, between New York and Chicago, arrived on time at destination 25 days during May.

Pending final adjudication of the Illinois passenger fare case, the railroads and the Illinois authorities have come to an agreement, according to which the carriers are collecting 24 cents a mile, at the same time giving coupons representing the difference between the fares at the 2-cent and the 24-cent rates. These coupons will be redeemed by the railroads if the lower rate is sustained.

The Canadian Pacific announces that during the summer season, and up to September 30, open top observation cars will be attached to the rear of four trains between Field, B. C., and Kamloops, and on two trains between Sicamous and Vancouver, for the free use of standard sleeping car passengers. The schedules have been arranged so that the entire trip through the mountains may be made in daylight.

The Public Utilities Commission of New Jersey has issued a statement replying to a complaint that the railroads have been unreasonable in their curtailment of passenger train service. The commission says that most of the complaints have been based on unwillingness to bear inconvenience which is not great. The statement justifies the railroads in diminishing passenger service in order to provide additional facilities for moving the increased freight traffic.

The movement of traffic through the Suez Canal, in 1916, amounted to 12,325,347 tons, a falling off of about three millions from the movement of 15,266,155 tons in 1915—which, in turn, was about four millions less than the total in the year preceding. The toll rates paid by vessels going through have been increased and now are about 36 per cent higher than before the war. The number of vessels passing through in 1916 was 3,110, a decrease from 1915 of 598 vessels.

The Public Service Commission of Maryland has authorized the railroads of the state to file freight tariffs showing increases substantially equivalent to those which have been or may be authorized by the Interstate Commerce Commission, in connection with its recent order, for interstate business. The Maryland commission at the same time has authorized the Pennsylvania and the Western Maryland to make certain increases in charges for storage of iron and steel articles.

The South Dakota Railroad Commission has ordered the adoption in that state of the same demurrage rules that govern interstate business. The Public Utilities Commission of Kansas has issued an order continuing in effect the demurrage rules previously in force, which provide for charges of \$1 a day per car for the first two days after 48 hours' free time, \$2 per car for the next two days, \$3 per car for the subsequent two days, \$4 for the next two days and \$5 per car for each succeeding day.

The commercial development department of the Baltimore & Ohio has begun an agricultural preparedness survey. It will cover each county adjoining the lines of the road and will show the number of acres in 1917 and 1916 planted in potatoes, beans, peas, wheat, buckwheat, oats, other grains and vegetables. It is also intended to show which of the following items has been the limiting factor in the increased production: lack of labor, cost of seed or fertilizer, character of the land, lack of equipment or limited capital.

In the Federal court at Lexington, Ky., June 23, suits were filed by the Amherst Coal Company and the Virginia-Buffalo Coal Company against the Chesapeake & Ohio Railway for

\$550,888 damages for failure to furnish coal cars sufficient to take the shipments which these companies would have sent but could not. The first-named company sues for about one-third of this amount, and the other one for two-thirds. The suits have to do with the period from December, 1915, to April, 1917, the charge being that during this period the shippers lost profits on about 300,000 tons of coal which they could have sold if they could have shipped it. An itemized list is presented showing the amounts of coal which ought to have been shipped each month. Other similar suits have been filed against this road by other coal companies in the same court.

### Car Efficiency in Detail

The San Francisco committee of the Car Service Commission has issued an appeal to the public which says in part:

Shippers: Order direct, in writing, from local representatives at points of loading only the number and kind of cars suitable for your needs, together with the amount or weight of shipments. Load and furnish shipping instructions in one day; the earlier in the day the better the opportunity to get car moving. In accepting orders for shipments secure sufficient tonnage to fill completely a 60-, 80- or 100-thousand lb. capacity car, including the 10 per cent which cars may be loaded above marked capacity.

Receivers: Place your orders in quantities to provide a full carload, as above described. . . . Unload cars the day received. Quick release increases the supply available for yourself and others. . . . Loss of car space and capacity is the most serious factor today causing the so called car-shortage.

### Curtailement of Passenger Service in West

The withdrawal of passenger trains from service on western roads has not been so general or as far reaching as in the East. Railroad officers state that they are prepared to take off trains as soon as the movement of troops and military supplies reaches the volume which makes such a step necessary. Up to this time the changes that have been made, except on a few roads, affect local service mainly. The Chicago & Alton recently withdrew from service trains aggregating about 1,000 passenger-miles per day. The Chicago, St. Paul, Minneapolis & Omaha removed a number of local trains from service, effective July 8, including six trains each on the eastern, northern and western divisions, and two on the Nebraska division. On July 14 the Illinois Central will discontinue two trains running between Fulton, Ky., and Memphis, Tenn. In April the Chicago Great Western took off a passenger train running between Randolph, Minn., and Mankato; one between Waverly, Iowa, and Sumner, and one between Cedar Falls, Iowa, and Cedar Falls Junction. The Wabash on June 24 discontinued a train between Montpelier, Ohio, and Buffalo, N. Y., and one between Buffalo, N. Y., and Detroit, Mich. The Atchison, Topeka & Santa Fe announces that it expects to run all of its transcontinental trains as heretofore, and orders have recently been placed with the Pullman Company for additional sleeping cars.

### Long Island Traffic in Manhattan

The contract under which the Long Island uses the Pennsylvania Station, Seventh avenue, Manhattan, New York City, as its western terminal, expires on July 1, and the New York State Public Service Commission, First district, has been holding hearings on the application of the company for permission to renew the contract for one year. The Long Island pays the Pennsylvania \$810,000 for its accommodations, including track rights from Sunnyside, four miles east of the terminal, and electric current for motive power.

The basis of payment, which is the number of cars run to and from the terminal station, was questioned, but the representative of the road replied that this made little or no difference, as the compensation was much below a reasonable percentage on the cost of the railroad and terminal. The Manhattan terminal has cost the Pennsylvania Railroad \$112,000,000.

The Long Island uses seven of the 24 tracks in the station; and 70 per cent of the passengers using the station are those who leave or take Long Island trains. The Pennsylvania, carrying only 30 per cent of the passengers, brings into the station 70 per cent of all the cars. The number of passengers to and from the terminal in Long Island trains last year was 13,000,000, an increase of about 7,000,000 since 1912.

## Commission and Court News

### INTERSTATE COMMERCE COMMISSION

The commission has issued a memorandum to clear up a misunderstanding as to the interpretation of its decision in the 15 per cent rate case allowing increases in class rates in Official Classification territory. The decision authorizes increases in class rates applying intra-territorially and differences of opinion as to what rates are included in class rates have arisen. The commission holds that rates that are published as class rates or as specific percentages of certain class rates are "class rates," and that rates that are published in the form of commodity rates, and which do not automatically change with a change in the class rate, even if the basis of making them is a percentage of some class rate or rates, are not included in the term "class rates." Rules 25, 26 and 28 in the Official Classification are regarded as respective classes.

#### Commission Cannot Require Use of Special Equipment

*Railroad Commissioners of the State of Florida v. Southern Express Company et al. Opinion by Commissioner Clark:*

Upon complaint that the facilities for the shipment of strawberries from Florida points to various destinations in eastern trunk line territory are inadequate and defective and that the rates for transportation and refrigeration are unjust and unreasonable; the commission holds, that following the decision of the Supreme Court of the United States in *United States v. Pennsylvania R. R. Co.*, 242 U. S., 208, the commission is without authority, in the absence of undue discrimination, to order carriers to acquire equipment of a special type or to require the transportation of refrigerator cars in passenger or special trains. The rates and refrigeration charges for the transportation of strawberries from and to points involved, are not shown to be unjust or unreasonable. (44 I. C. C., 645.)

#### Rate Advances

The commission has given special permission to the western railroads to file supplements to their freight tariffs upon not less than five days' notice increasing rates on coal and coke by not to exceed 15 cents a ton, in accordance with its decision in the 15 per cent rate case. The order provides that such supplements may provide for a horizontal increase in rates, to the extent specified, without specifically publishing the exact rate per ton, and without strict regard to the tariff rules restricting the issuance of supplements, provided that the carriers obligate themselves to file on statutory notice new tariffs to replace such supplements. The carriers have arranged to put the new rates into effect at once.

The commission has also issued an order, in response to an application by a committee representing the carriers in official classification territory, authorizing them to establish the advanced class rates authorized by the findings of the commission in the 15 per cent case, and to continue the general rate relations existing in the present rates, without observing the long and short haul provision of the law. The supplements proposing the general 15 per cent advance, which were suspended by the commission until October 28, were promptly cancelled by the carriers in response to the suggestion of the commission in its decision.

The commission has given permission to the Southern Pacific to change on one day's notice its rates on commodities transported as all water shipments between New York and New Orleans, and between New York and Galveston, in accordance with its application of June 13, to put into effect rates which will meet the findings of the commission under the company's application under the Panama Canal Act in connection with its ownership of Atlantic steamship lines.

The commission has vacated the suspension orders in 60 cases on its investigation and suspension docket in which the carriers have filed tariffs cancelling the schedules under suspension.

### C. F. A. Class Scale Rates

The Interstate Commerce Commission, in a decision by Commissioner McChord, given in 45 I. C. C., 254, has allowed the carriers to remodel their scale of class rates in Central Freight Association territory, with a view to putting them on a more consistent and in general on a somewhat higher scale than the present one. A brief abstract of the commission's decision follows:

In the commission's first report in the Five Per Cent Case, 31 I. C. C., 351, the commission found, among other things, that the class rates in C. F. A. territory were on a lower scale than elsewhere in the country and held that the carriers were entitled to the increase sought and probably more. It was pointed out that the existing class rate structure was "honey-combed with inconsistencies," and it was suggested that a general readjustment would be desirable.

The carriers thereupon proceeded to make a general revision of their rates, and after two years' work have submitted a new rate structure. The proposed new system is designed both to yield the carriers greater revenues and remove some of the inconsistencies in the present rate structure. The case, however, has no particular connection with the 15 Per Cent Case, 45 I. C. C., 303. So far as the lines in C. F. A. territory are concerned that increase was asked in addition to and built upon the rates here involved.

Considerable sentiment was manifested among the shippers at the hearing in favor of permitting the carriers the increased revenue which would be yielded by the rates in issue. This was probably why many persons believed that the carriers should have some assurance in view of the unusual conditions confronting them. It is probable, however, that there might have been some opposition had the proposal for the general increase of 15 per cent taken definite shape before the hearings in this case were concluded. The principal objection to the proposed rates was on the part of the localities which now enjoy rates designed to relieve them of some of the disadvantages of location and which are here called upon to pay rates made with a greater regard for distances and transportation conditions generally.

Owing to differences in traffic and transportation conditions, respondents in the first place propose to divide C. F. A. territory into three separate sections or zones, and to use three separate scales of rates. The principal zone embraces all the territory on and south of the line of the Michigan Central from Chicago to Detroit, through Kalamazoo and Jackson, Mich., and will be hereinafter referred to as zone "A." The two other zones are in Michigan and are to be known as zones "B" and "C." Zone B lies immediately north of zone A, and is bounded on the north by a line running from Muskegon, on the east bank of Lake Michigan, eastwardly across the state through Greenville, Edmore, Alma, Saginaw, Midland, Bay City, and Sandusky, Mich., to Lake Huron. Zone C lies directly north of zone B and includes the remainder of the southern peninsula of Michigan. The northern peninsula of Michigan, with the exception of the cities of Menominee and Manistique, is not in C. F. A. territory. Zone C also embraces, via car-ferry routes, the west bank of Lake Michigan north of Milwaukee, Wis. Respondents propose one scale of rates for general use within zone A, but two higher scales for making rates to apply between zones B and C, respectively, on the one hand, and zone A on the other. For instance, the zone A scale is to be applied from Cincinnati to Toledo, Ohio; the zone B scale from Cincinnati to Lansing, Mich., and the zone C scale from Cincinnati to Alpena, Mich. In determining the actual rates between given points, the proposed procedure is as follows: For one-line hauls of distances up to and including 70 miles, the scale is strictly applied; that is, in accordance with actual distance. But actual distance is not applied via one-line hauls of more than 70 miles or for hauls of any length over two or more lines, except between basing points. In the two latter cases rates between the various basing points are arrived at by applying the scale in accordance with actual distance, and the rate to or from any intermediate point is the same as the rate to or from the basing point next beyond—no matter how far beyond. These situations represent what the protestants call "inflations."

The commission in its findings refuses to accept the zone A and zone B scales as proposed by the carriers, but suggests new scales. Concerning these scales and its objections to the carriers'

scales, it says: "While we are convinced that, upon the whole, the proposed system of rates is superior to the present rate structure, we cannot allow it to become effective. The scales must be broken up into smaller mileage blocks, and the so-called inflations reduced by the observance of substantially actual distances on one-line hauls, and by the setting in of additional basing points for hauls over two or more lines, except to and from zone C, wherever the distance between the basing points now used exceeds 20 miles. The proposed rates, like the present rates, are preferential to short-haul traffic. The rates from Cadillac and Jennings, Mich., as applied to lumber, should be placed on the same basis as regards the relationship to sixth class, as may be contemporaneously applied from other Michigan producing points, except where competitive conditions may warrant a departure. The charging of a slightly higher basis of rates to and from zones B and C has our approval. We will not interfere with the groups as proposed, nor with the methods used in applying the scales, except as noted above. To grant the prayer of the cities adversely affected by the removal of preferences, the commission would in effect require what the act to regulate commerce was largely designed to prevent, namely, unlawful discrimination. Rate relationships long maintained may not be lightly disturbed, but where they are not justifiable as a matter of law we cannot require their continuance.

"As fully appears from the consideration discussed in this report a determination of reasonable class rates for application in C. F. A. territory must take into account numerous conditions, such as rate adjustments effective in the past and the rates now applicable to traffic between C. F. A. and trunk line territories, which tend to support a different basis of rates than that which might be found reasonable in the absence of such conditions. We find that respondents have not justified the rates named in the suspended tariffs. We further find that the scales of class rates compiled by the commission and given in Appendices Nos. 9 and 10 of the report are reasonable and may be used in lieu of respondents' scales A and B and in the same manner, subject to the modifications required by the next preceding paragraph. These scales are divided into 5-mile blocks for distances up to and including 100 miles. They then progress by 10-mile blocks up to and including 300 miles. Beyond that, 20-mile blocks are used. The zone A scale begins with 16 cents as the first-class rate for 5 miles and less. One cent is added for each succeeding block up to and including 50 miles. Beyond that, up to and including 100 miles, on the theory that the charge per ton-mile should decrease, it progresses by additions of one-half cent for each mileage block. Thence, up to and including a distance of 200 miles, it progresses by additions of 1 cent per block, or twice as much as for the blocks for the distances from 50 to 100 miles, for the reason that the blocks are doubled in size. On the theory that the charge per ton-mile should further decrease for longer distances, an increase of one-half cent per block is then used up to and including 300 miles. Beyond that, as the blocks have doubled in size, the degree of progression is doubled, 1 cent per block being observed. The rates on the lower classes are in all cases related to first class, according to the following percentages:

1	2	3	4	5	6
100	85	67	50	35	28

"We may say as a matter of information that in the Chicago-New York scale the rates for the lower classes appear to be related to the first-class rate, according to the following percentages:

1	2	3	4	5	6
100	86%	66%	46%	40	33%

"The zone B scale starts with a rate 2 cents higher on first class for 5 miles than does the zone A scale. For use to and from zone C, or subdivisions thereof, respondents may work out scales of differentials to be added to the rates in the zone B scale.

"In publishing the rates the following rule for the disposition of the fractions shown in these scales shall be observed: Fractions of less than  $\frac{1}{4}$  or .25, to be omitted; fractions of  $\frac{1}{4}$  or .25, or greater, but less than  $\frac{3}{4}$  or .75, to be shown as one-half ( $\frac{1}{2}$ ); fractions of  $\frac{3}{4}$  or .75, or greater, to be increased to the next whole figure.

"In connection with this case, hearing was had upon applications for continuance of certain existing departures from the long-and-short-haul rule of the fourth section of the act, but they will be disposed of separately."

## PERSONNEL OF COMMISSIONS

M. O. Lorenz, assistant statistician of the Interstate Commerce Commission, has been appointed acting statistician, succeeding W. J. Meyers, resigned.

W. M. Lockwood, examiner in the division of statistics and accounts of the Interstate Commerce Commission, has been appointed chief clerk and purchasing agent, succeeding Lester Sisler.

## COURT NEWS

### A Ten Year-Record

It was in 1907 that the State of New York, under the leadership of Governor Charles E. Hughes, passed its radical and comprehensive law for the regulation of railroads and other public utilities, abolished its old railroad commission and provided for two new commissions, one of which has to do only with New York City. This last-mentioned commission has issued a brief review of its work, which says in part:

"The Public Service Commission for the First district was ten years old on July 1. Under the powers granted by the law the commission is constructing the great dual system of rapid transit involving the expenditure of an amount between \$350,000,000 and \$400,000,000, about one-half of which is being contributed by the City of New York. This work has been properly described as the greatest single municipal transportation achievement in America. This system, including the third tracking of the elevated lines, will add 345 track miles to the existing subway and elevated rapid transit mileage, and will give New York City something more than 600 track miles of such lines, more than is possessed by any other single city in the world, and more, it is said, than all of the other cities of the United States put together. Under its regulatory powers the commission for the First district has exercised jurisdiction over stock and bond issues of corporations, and has effected a great and positive saving of human life by the enforcement of safety precautions and the installation of safety devices. It has handled many thousands of complaints from the patrons of public utilities, and has settled a large proportion of those complaints really justified, to the satisfaction of the complainants.

"The strength of the law has been demonstrated by the fact that during the ten years it has undergone very few amendments. Corporations have always fought the commission, and even today a gas company is questioning its right, in the United States Supreme Court, to direct an extension of its lines for the benefit of persons in an outlying and sparsely settled community. But the majority of the corporations have accepted its jurisdiction in a sportsmanlike spirit, and they have fallen into the habit of yielding gracefully to its orders when they fail to evade them by blandishments.

"Under the unflagging labor of the commission the dual system is nearing completion. There is a prospect that a large proportion of the most important lines will be in operation before the end of the year.

"Important results of the commission were the elimination of horse cars, additional facilities in the subways, such as steel cars, longer platforms, longer trains, new means of ingress and egress, and signal control in subway operation by which the greatest number of trains can be safely operated in the least amount of time.

"Because of the transit bureau maintained by the commission with a large force of inspectors, the public utility corporations find it difficult to maintain for any length of time any method of conducting their business that threatens the public welfare.

"Through its electrical engineer, its gas engineer, and its bureau of gas and electricity the commission has performed extremely important work in connection with the rates charged and the quality furnished. Important reductions in rates have already been made.

"There are in the city some 400 grade crossings on high speed railroads. Their elimination is an extremely costly proposition, but the commission has undertaken the task by beginning the elimination of some of the most dangerous of them, and there are to date eliminated or in process of elimination forty-two of the worst crossings, involving a total expenditure of \$4,211,000."

### Excessive Damages for Wrongful Ejection

A passenger boarded a train at Gower, Mo., to go to St. Joseph, 20 miles away, without having had time to buy a ticket. The lawful rate of fare was 2 cents a mile, and he tendered 40 cents to the conductor, who refused it and demanded 60 cents, or 3 cents a mile. The passenger refused to pay this rate and was ejected half or three-quarters of a mile from the station, to which he had to walk back. Some time prior to this the Supreme Court of the United States had dissolved the injunction which the railroad had obtained against the enforcement of the two-cent fare law. In an action against the company the passenger claimed actual and punitive damages grounded on the conductor's manner and conduct towards him. The conductor took the passenger by the arm and led him to the door of the car, but there was no scuffle. The evidence conflicted as to whether the conductor swore. The jury returned a verdict of \$5 actual and \$500 punitive damages. The trial court, accepting the jury's view that some punitive damages should be allowed, thought the award excessive and offered the plaintiff an opportunity to take \$100 punitive damages. This the plaintiff refused, and on appeal the Kansas City Court of Appeals affirmed the judgment of the trial court granting a new trial.—*Smith v. Atchison, T. & S. F. (Mo.)* 194 S. W. 71. Decided April 2, 1917.

### Putting Off Passenger at Wrong Station—Excessive Damages

A minor passenger 16 years old was told by a train employee that her station was reached and he assisted her from the train at the wrong station. The train left before she could board it again. The station agent took her to his house, where she spent the night and next day she was carried to her destination by another train. In an action for damages the Mississippi Supreme Court held that an award of \$500 was excessive and reduced it to \$200.—*Yazoo & M. V. v. Duke (Miss.)*, 74 So., 693. Decided March 26, 1917.

In another case in the same court it appeared that a female passenger was set down at the wrong place and had to walk something like half a mile to the station in the rain. The court held that a verdict in her favor for \$750 was grossly excessive and should be set aside and a new trial ordered unless the plaintiff consented to a remittitur of \$650, in which case she should have judgment for \$100.—*Case v. Yazoo & M. V. (Miss.)*, 74 So., 773. Decided April 9, 1917.

A passenger, a farm hand, who had almost reached his majority, was wrongfully ejected from a train on a dark night in July and compelled to walk 20 miles to his destination next day. He was made sick by a cold and rendered unable to work for about a week. The Springfield Court of Appeals (Mo.), held that a verdict of \$750 was excessive and a new trial was ordered unless the plaintiff would remit \$400 of that amount.—*Davis v. Lusk (Mo.)*, 190 S. W., 362.

### Proof of Cause of Fire

In an action for damages for the destruction of a shed and certain hay and straw, it was alleged that the property was negligently set on fire by "coals of fire" from the defendant's engine. The plaintiff asserted that all that it is necessary to prove in the jurisdiction of Utah is that the fire was caused by an engine, and from that fact it may be inferred that the fire was negligently set. The Utah Supreme Court, however, held that the question always is, How is the fact established that an engine caused the fire in question? In no case in any court where the matter is not covered by statute has it been held that all that is necessary to prove is that an engine passed certain premises, and that a fire was discovered on those premises a short time thereafter. It is universally recognized that there must be some evidence from which it may legitimately be inferred that the fire in question was caused by the passing engine and not by some other agency. To establish the probability that the engine in question caused the fire, the plaintiff may show that the engine, at the time the fire was set, cast out live sparks, or that it set fire to the dry grasses, or otherwise; and to strengthen the probability that engines do set fires, it may also show that other engines of the defendant did the same thing within a reasonable time both before and after the fire in question. When these facts are shown, the jury may infer that the fire was caused by the engine. It is important to keep in mind, however, that railroad companies are by law

permitted to operate their engines by means of fire; and also that it is possible that engines may cause fire without negligence. It is necessary, therefore, to prove: (1) That the fire in question was caused by an engine of the defendant; and (2) that it was negligently caused. Negligence may be inferred if it is shown that the engine caused the fire, but until that is shown by the exclusion of other agencies, there can be no inference of negligence.—*Gleason v. San Pedro, Los Angeles & Salt Lake (Utah)*, 164 Pac., 484. Decided April 4, 1917.

### Rebilling Interstate Shipments

In an action for damages for injury to live stock during transportation from West Plains, Mo., to Princeton, Kan., the principal question was whether or not the shipment was interstate. The court stated the facts as follows: "West Plains is a station on the Frisco; Princeton is a station on the Santa Fe. The plaintiff loaded an emigrant car with household goods and horses at West Plains, and billed the car to Kansas City, Mo., over the Frisco. The car was there delivered to the Santa Fe and was rebilled by the Santa Fe to destination. The Santa Fe billing read from Argentine, Kan., to Princeton. Argentine is separated from Kansas City by the line between the two states, but the Santa Fe yards at Argentine extend into Kansas City (Mo.). The car was placed on the Santa Fe tracks by the Frisco. The car, in fact, passed in course of continuous transportation, without unloading, from West Plains to Princeton. The plaintiff testified that the Frisco agent at West Plains would not bill the car to any place in Kansas unless the horses were inspected. In order to avoid inspection the plaintiff billed the shipment to Kansas City, intending to drive the horses from there to Princeton. On the way to Kansas City, or when the car arrived there, he changed his mind, and after inspection, the horses went on in the car with the household goods. The horses were injured while on the line of the Santa Fe. The trial court allowed the jury to determine the character of the shipment, under an instruction that they might find it was not interstate if they found the plaintiff's original intention was to ship the horses by rail to Kansas City and then drive them to Princeton. The jury found the shipment was not interstate." Judgment for the plaintiff was reversed, on appeal, by the Kansas Supreme Court for the following reasons:

The only conflict in the evidence was whether the Frisco, when it placed the car on the Santa Fe tracks, left the car on the Kansas side, or the Santa Fe's switch engine which picked up the car crossed the state line to get it. The court did not regard this matter as material. It is well settled that the essential character of commerce, as disclosed by all the facts, and not its incidents, such as local or through bills of lading, determines its character as interstate or otherwise. In this instance, Kansas City was at no time the destination of the horses any more than it was the destination of the household goods in the same car. All the articles in the car were destined from the beginning for Princeton. To avoid the burden of inspection, the plaintiff at first intended to change the method of transporting the horses on arrival at Kansas City, but with the exception that the horses were to be unloaded there for driving, all the property placed in the car started on a continuous journey, not to Kansas City, but to Princeton. On the way to Kansas City, or on arrival there, the plaintiff concluded not to substitute driving for railroad transportation, and the car with its original contents proceeded uninterruptedly to its previously determined destination. The necessary rebilling was a mere incident to the shipment as to both the horses and the household goods. In taking the car from the Frisco the Santa Fe was apprised of the fact that it was completing a shipment originating on that road. To hold that the Santa Fe billing was an independent, intrastate matter would open the way to evasions which would deprive Congress of control over interstate commerce.

The bills of lading of both railroads required an action to be commenced within six months. This was not done. There was evidence of conduct on the part of Santa Fe employees which under local rules might have amounted to a waiver of the limitation. Since the shipment was interstate, however, the railroad could not waive the provision.—*Easdale vs. A. T. & S. F. (Kan.)*, 164 Pac. 164. Decided April 7, 1917.

## Equipment and Supplies

### LOCOMOTIVES

THE BOSTON & MAINE is reported as contemplating the purchase of locomotives.

THE FORT SMITH & WESTERN has ordered 2 Consolidation locomotives from the Baldwin Locomotive Works.

THE ST. CLAIR REFINING COMPANY, Chicago, has ordered one six-wheel switching locomotive from the American Locomotive Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 30 Mikado locomotives from the Baldwin Locomotive Works for January delivery, and has reserved space for an additional 70 locomotives for 1918 delivery.

THE KURE NAVAL YARD of the Imperial Japanese Navy has ordered 3 four-wheel tank locomotives from the American Locomotive Company. One of the three locomotives will weigh 97,000 lb., and other two 42,000 lb. each.

### FREIGHT CARS

THE SHELL COMPANY, Los Angeles, Cal., is in the market for 50 to 100 tank cars.

PHELPS, DODGE & CO., New York, have ordered 250 gondola cars from the Standard Steel Car Company.

THE UNION RAILROAD has ordered 1,500 70-ton hopper cars for the H. C. Frick Coke Company from the Ralston Steel Car Company. The Union Railroad was also reported in an unconfirmed item in the *Railway Age Gazette* of June 29 as having ordered 1,000 cars from the Greenville Steel Car Company; this item was incorrect.

### IRON AND STEEL

THE GREAT NORTHERN has ordered 270 tons of bridge steel from the Wisconsin Bridge Company.

### SIGNALING

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company 49 one-arm signals—three-position double case, 2-phase A. C. Style "S," which will be installed by the railroad company on the Goffs-Bagdad division.

THE PHILADELPHIA, BALTIMORE & WASHINGTON has ordered from the Union Switch & Signal Company an electro-mechanical interlocking machine to be installed by the railroad forces at Harrington, Del. The machine will have 17 mechanical and 6 electric working levers.

THE PHILADELPHIA & READING has ordered from the Union Switch & Signal Company a type "F" electric interlocking plant to be put in at Skillman, N. J. The interlocking machine, model 14 d. c., will have 13 switch and 15 signal levers. The track circuits for this interlocking will be a. c.

THE LOUISVILLE & NASHVILLE is to install automatic block signals on its line between Montfort, Nashville and Corbin, and La Follette, Tenn. Thirteen Style "S" low voltage ground signals and auxiliary apparatus will be required and are to be supplied by the Union Switch & Signal Company.

THE BUFFALO, ROCHESTER & PITTSBURGH is to install an electric interlocking machine near DuBois, Pa., with a machine having 11 working levers and 5 spare spaces; also, at other places, three mechanical interlockings. The General Railway Signal Company furnishes the material and will install the electric apparatus.

AERIAL MAIL FROM ITALY TO SICILY.—Aerial mail service was inaugurated on June 27 in Sicily. An airplane which left Naples at 6.04 a. m. arrived at Palermo three hours later, returning to Naples in the evening with Sicilian mails.

## Supply Trade News

Charles B. Yardley has been elected president of Steel & Iron Mongers, Inc., with offices at 796 Broad street, Newark, N. J.

Murray Shipley has sold his entire interest in the Lodge & Shipley Machine Tool Company, Cincinnati, and has severed his connection with that company.

At a meeting of the board of directors of the American Locomotive Company, held June 21, L. A. Larsen was appointed assistant comptroller, effective July 1.

Willard Doud, consulting engineer, Old Colony building, Chicago, Ill., has closed his office temporarily to accept a commission as lieutenant, junior grade, in the United States Naval Reserve. He has been assigned to active service at the Naval Training Station, Great Lakes, Ill.

Charles S. Clark, formerly sales agent of the Pennsylvania Steel Company at Boston, has been elected first vice-president and general manager of the Laconia Car Company, and will make his headquarters at Laconia, N. H., where the business of the company will be transacted hereafter.

Daniel A. Wightman, formerly general manager of the Pittsburgh Locomotive Works, died at Warren, R. I., July 6. Mr. Wightman was born at East Greenwich, R. I., in 1846. He was educated in the public schools of that town, and after a course in an evening school in Providence, entered the employ of the Rhode Island Locomotive Works as a draftsman. In 1876 he went to the Pittsburgh Locomotive Works as superintendent. He later became general manager and held that position when he retired in 1902.

Harrison Arms, president and founder of the Arms Palace Horse Car Company, Chicago, died at his country home at Marshall, Mich., on July 5. While engaged in the livery business at Toledo, Ohio, he conceived the idea of equipping railroad cars to carry horses in a safe and humane way by providing each horse with a separate stall and adequate feeding and watering facilities while in transit. He later invented and patented the "Arms Palace Horse Car," embodying all of these features, and in 1885 organized and incorporated the Arms Palace Horse Car Company, of which he was elected president, which position he actively filled until his last illness.

David A. Munro, formerly manager of the J. N. Johns Manufacturing Company, has accepted a position with the Railway Specialties Corporation, New York, and will take active charge of that company's railroad department. Mr. Munro was born in Scotland. He came to this country in February, 1907, and in October of the same year entered the auditor's office of the Metropolitan Street Railway in New York. He was later assistant to the auditor of the Second Avenue Railroad of New York, and was shortly afterwards appointed purchasing agent to the receiver in addition to his other duties. On December 1, 1916, he resigned to enter the supply field as manager of the J. N. Johns Manufacturing Company.

Oden H. Wharton, formerly assistant to the president of the Crucible Steel Company, has been elected president of the company. Mr. Wharton was born at Easton, Pa., and received his schooling at that place. His first business association was with Park Brothers & Co., Ltd., at that time operating the Black Diamond Steel Works in Pittsburgh. He started as office boy, then became billing clerk and finally a salesman. Later he was connected with the sales department of the Park Steel Company in Cleveland and other cities. He went to Boston for some years as representative of the Park Steel Company, and later of the Crucible Steel Company of America, and was finally appointed general manager of sales of the latter company, with headquarters at Pittsburgh. After holding this position for several years his health failed, and he was succeeded by Reuben Michener, the present general manager of sales. Mr. Wharton traveled in Europe for a year or more, and, regaining his health, was appointed assistant to President Charles C. Ramsey, of the Crucible Steel Company, who died recently.

### American Car and Foundry Company

The American Car and Foundry Company in the fiscal year ending April 30, 1917, had earnings from all sources of \$17,522,909. After deducting from this \$7,212,037 for renewals, replacements, repairs, new patterns, flasks, etc., and the cost of special equipment for the production of munitions, there was left net earnings of \$10,310,872. The surplus for the year, after the deduction of dividends and reserves, was \$1,010,872, and the total surplus at the close of business on April 30, 1917, was \$26,820,965, as compared with \$25,810,094 on April 30, 1916.

The annual report to the stockholders, submitted by President W. H. Woodin, says in part: "The close of your fiscal year saw the United States at last drawn into the great conflict of nations that for almost three years has been devastating the earth, and witnessed the beginning of that marshaling of our national resources and industries which it is to be hoped will speedily prove the decisive factor in the great struggle.

"Your company was among the first to place its facilities unreservedly at the disposal of the government, to be put to such use as might best suit the national needs. Already some portion of the work which our country has taken upon itself as its part in the righteous war in which we are engaged, has been allotted to your company, and it is a fair assumption that we shall hereafter be called upon to play an increasingly greater part in the struggle that lies before us. Our government, and the stockholders, may be assured that this company will give of its best—in experience, in organization, in production—to insure the making of that lasting peace short of which the United States and its allies will not stop.

"From the viewpoint both of operations and results, the year has been a satisfactory one. The performance of your company in the production of munitions has been gratifying not only as to quality but also with respect to volume and speed of production, and has not been excelled by any other company in the United States. The representatives of the governments for which your company has been producing munitions have been unstinted in their expressions of approval of its organization and methods. The experience acquired in this branch of industry will without doubt prove of very great value to our government, enabling your company quickly and economically to meet what promises to be a very large demand for such supplies.

"A fair share of the year's earnings resulted from the conduct of your company's ordinary business in the manufacture and sale of cars and miscellaneous supplies. Material costs have been high and are likely to continue so. This, together with the increased cost of operating, coupled with an inability to obtain a corresponding augmentation of revenue, makes it growingly difficult for the railroads to finance the purchase of new equipment in quantities sufficient to meet the normal traffic requirements of the country. The need of means of transportation, both for domestic and foreign use, is so great, however, that it is reasonable to expect that, with the advent of more propitious conditions, your company's facilities for this line of production will continue in fair demand.

"At the close of the year your company had on its books for construction a greater number of cars than at the beginning."

The general balance sheet follows:

ASSETS		LIABILITIES	
Property and plant acct.	\$66,782,533	Preferred stock .....	\$30,000,000
Current assets—		Common stock .....	30,000,000
Materials on hand...	19,211,221	Current liabilities—	
Accts. and notes recv.	17,713,438	Accts. payable, etc...	16,225,942
Stocks and bonds of other companies ..	968,243	Dividends (pay. July 2, 1917) .....	625,000
Cash .....	6,017,220	Reserve accounts—	
	\$110,692,655	For insurance .....	1,000,000
		For gen. overhauling imp. and mainte....	2,620,748
		For dividends .....	2,400,000
		For imp. working conditions of emp....	500,000
		Surplus account .....	26,820,965
			\$110,692,655

John Sherman Hoyt and W. C. Dickerman have been elected directors of the company, succeeding Thomas H. West and W. N. McMillan, respectively.

### TRADE PUBLICATIONS

**BOILER KOTE.**—The Boiler-Kote Company, Chicago, in a 16-page booklet, details the advantage of using Boiler-Kote in boilers, and shows how it is used to secure the desired results.

## Railway Construction

**ALABAMA, FLORIDA & SOUTHERN.**—W. S. Wilson, vice-president and general manager of this road, has bought a line running from Cowart, Ala., southwest to Cottonwood about 9 miles, and work is now under way on a connection from this line at Cottonwood east to a point on the Alabama, Florida & Southern about 15 miles. A line is also being built from the present southern terminus of the A. F. & S. at Malone, Fla., south to Greenwood, 6 miles. These new lines will be completed by October 15, and will then be sold to the Alabama, Florida & Southern.

**ATCHISON, TOPEKA & SANTA FE.**—This company has awarded a contract to the Cresmer Manufacturing Company, Riverside, Cal., for the erection of buildings at its car shops at San Bernardino, including a one-story refrigerator car repair shed, 46 by 1,200 ft.; a one-story blacksmith shop, 50 by 385 ft., and a one-story car repair shop, 46 by 310 ft. The cost of these improvements will approximate \$60,000.

**CANADIAN PACIFIC.**—This company is spending \$75,000 to re-ballast its line between London, Ont., and Windsor. The road will also spend approximately \$185,000 to lengthen sidings and strengthen bridges between London and West Toronto in order that heavier power may be used on this sub-division.

**CHICAGO, MILWAUKEE & ST. PAUL.**—This company is drawing preliminary plans for a passenger depot at Tacoma, Wash., the construction of which will not be started this year.

**CHICAGO, ROCK ISLAND & PACIFIC.**—A contract has been awarded by this company to the Railroad Water & Coal Handling Co. for the construction of a wooden coaling station of 500 tons capacity at Trenton, Mo. The road has also let a contract for the building of a reinforced concrete dam at Kingfisher, Okla.

**CHICAGO SHORT LINE.**—This road, which serves several industries in the Calumet district of Chicago, has purchased land upon which a roundhouse and coaling station will be erected. No detailed information concerning the construction of these improvements is available at this time.

**DALLAS-SOUTH WESTERN TRACTION.**—This company will construct an interurban line from Dallas, Tex., west to Irving, and then south to Cleburne, a distance of 59 miles. A contract has been let to the Creek Construction Company, Sapulpa, Okla., for the grading, track-laying and bridge work. The road will soon be in the market for ties, rails and equipment. F. R. Perkins, 303 Gaston building, Dallas, is the engineer in charge.

**ERIE.**—This company is building yard tracks between a point two miles west of Marion, Ohio, and a point four miles west of Marion. The work will involve the realignment of one main track and the building of one 50-ft. single-track bridge; one 50-ft. four-track bridge; one 45-ft. single-track bridge, and one 85-ft. single-track bridge. A contract has been let to the Robert Grace Contracting Company, Pittsburgh, Pa., for the sub-structures. The work on the super-structures will be carried out by the railroad forces. The total estimated cost of the improvements is \$550,000.

**GULF, COLORADO & SANTA FE.**—This company, in conjunction with the Southern Pacific Lines, the Galveston & Houston (electric) and the county have awarded a contract to the Larkin & Sangster Company, Buffalo, N. Y., for the construction of concrete arch extensions to be built on both ends of the present Galveston (Tex.) causeway. The total length of the new construction will be about 5,900 ft. From the Galveston end it will cover 2,240 ft., and from the main land at Virginia Point 3,600 ft. The section of the arches, including the draw-bridge, that withstood the storm is 2,446 ft. long. There will be 51 new arches on the main land end, and 28 new arches on the Island of Galveston end, a total of 79 arches, each having a span of 60 ft. The arches will rest on piers supported by concrete piles driven into the clay. The Concrete Steel Engineering Company, New York, which designed the arch portion

of the original causeway that weathered the storm successfully, has been retained to design the extensions. The total cost of the work is not to exceed \$1,725,000.

**GULF, PLAINVILLE & NORTHERN.**—This company will build a line from Great Bend, Kan., north to Hoisington, Galacia, Hays City, Plainville, Wester, Edmund and Norton, approximately 150 miles. It will also build a branch line from Plainville north-east to Laton, Covert and Osborne, approximately 50 miles. A contract has been let to the Imperial Promotion & Construction Company, Osborne, Kan., who will buy all equipment, and do all sub-letting. Work on grading will commence about June 15.

**ILLINOIS CENTRAL.**—This company has let a contract to L. J. Smith Contracting Company, Kansas City, Mo., for the construction of a line from Dawson Springs, Ky., to Providence, a distance of 17½ miles. About 600,000 yd. of grading will be necessary, a large portion of which is rock. A contract has also been awarded to the Walsh Construction Company, Davenport, Iowa, for grade reduction and line revision on the road between Scottsburg, Ky., and Dawson Springs, a distance of 11½ miles. The work will involve 700,000 yd. of grading, a large portion of which is rock, and also the construction of a 75-ft. span and approach trestle over the Tradewater river.

**MEXICAN ROADS.**—J. W. McRae, of Joliet, Ill., owner of a timber tract of 75,000 acres situated in the Sierra Madre mountains of Mexico, about 40 miles southeast of Douglas, Ariz., proposes to build a railroad from Douglas to the scene of the proposed lumbering operations. Mr. McRae expects to find a market for his lumber at the mines and other industries of Arizona and New Mexico.

**NORTHERN PACIFIC.**—This company is enlarging its division yards at Livingston, Mont., by adding five miles of additional tracks. The increase of the yard necessitates the abandonment of the present storeroom facilities and the construction of a new two-story storehouse 50 by 200 ft., a storehouse platform 70 by 500 ft., and a reinforced concrete oil house 30 by 50 ft. The track work, together with store facilities and other changes, will cost approximately \$110,000. The work is being done by company forces, and is to be completed by September 1.

**PENNSYLVANIA LINES WEST.**—This company will build an addition to its shops at Columbus, Ohio, consisting of a tank shop, a machine shop, a boiler shop, and a flue shop. The tank shop will be 40 ft. high, 95 ft. wide and 300 ft. long; the machine shop, 60 ft. high, 100 ft. wide and 220 ft. long; the boiler shop, 40 ft. high, 143 ft. wide and 170 ft. long; and the flue shop, 20 ft. high, 83 ft. wide and 108 ft. long. The buildings will be of brick and steel construction, and the cost, including equipment, will be approximately \$1,000,000. Work will not be started until fall.

**PENNSYLVANIA RAILROAD.**—This company is now building a tank and cab shop at Juniata shops, Altoona, Pa. It is to be a one-story building, 82 ft. by 300 ft., of structural steel and brick construction. The work is being done by the railroad company's forces, the structural steel work having been ordered from L. F. Shoemaker, Pottstown, Pa.

This company has given a contract to A. L. Anderson & Bros., Altoona, Pa., to build about 9 miles of line along Ten-Mile Creek from Champion, Pa. (formerly Besco), southwest towards Waynesburg, to a point just below Jefferson.

**PHILADELPHIA & READING.**—Plans have been completed for a bridge to be built on Greenwood avenue over the P. & R. tracks at Hopewell, N. J. It is to be a through plate girder highway bridge, with concrete floor paved with asphalt, with a clear width of roadway of 24 ft. and two sidewalks 7 ft. each. The bridge will span four tracks, and the work will be done under the grading and masonry contract with John A. Kelley & Co., which was awarded over a year ago.

**VIRGINIAN RAILWAY.**—Contracts have been let to the Rinehart & Dennis Company, Charlottesville, Va., for the grading, and to the Virginia Bridge & Iron Company, Roanoke, Va., for steel bridges in connection with double tracking work now under construction, from Bud, W. Va., Mile Post, 371.5, easterly 5 miles. The maximum grade will be 2.07 per cent and the maximum curvature 12 degrees. There will be three steel bridges to have a total length of 1,125 ft. The track laying will be carried out by the railroad company.

## Railway Financial News

**BOSTON & MAINE.**—The \$100,000 first mortgage 4½ per cent bonds of the Peterborough & Hillsborough, a subsidiary of the Boston & Maine, which matured July 1, were technically extended for two years under authority of the United States District Court at Boston. Receiver Hustis of the Boston & Maine was given authority to purchase and hold in the treasury such of these bonds as holders desired to turn in.

**CANADIAN NORTHERN.**—Wm. A. Read & Co. have sold an issue of \$2,700,000 Canadian Northern one-year secured gold notes. These are to refund an issue of \$3,000,000 notes coming due July 10, and will have the same collateral as under that issue, consisting of first mortgage bonds of the Canadian Northern Railway, guaranteed as to principal and interest either by the Dominion of Canada or the Canadian Provincial governments.

**PETERBOROUGH & HILLSBOROUGH.**—See Boston & Maine.

**TENNESSEE CENTRAL.**—At the fourth attempt to sell this road on July 2, no bids were received, and the sale was adjourned until October 22. Judge Sanford, of the U. S. Circuit Court at Knoxville, Tenn., has appointed H. W. Stanley, formerly assistant general manager of the Seaboard Air Line, co-receiver with W. K. McAlister. Mr. Stanley succeeds H. B. Chamberlain, resigned.

**TOLEDO, PEORIA & WESTERN.**—Judge H. O. Humphrey in the U. S. Circuit Court at Danville, Ill., has appointed E. N. Armstrong receiver. This action was instituted by the Farmers' Loan and Trust Company, of New York City, trustees of the bondholders, on the failure of the railway to pay either interest or principal on the bonds July 1. The company holds \$4,895,000 first mortgage bonds against the railway. The bondholders' committee, consisting of Thomas Denny, Adrian Iselin and Henry K. McHarg, have requested holders of the above-named issue to deposit their bonds with the Farmers' Loan and Trust Company in order that protective measures may be taken by it.

**WHEELING & LAKE ERIE.**—At a meeting of the board of directors, Carl R. Gray, president of the Western Maryland, was elected chairman of the board, succeeding L. F. Loree, resigned. M. C. Byers and Bertram Cutler were elected directors to succeed H. H. Porter and Johnston De Forrest, resigned.

**GERMAN RAILWAYS IN CHINA.**—Germany has constructed two railways in China, the Shantung Railway and the northern section of the Tientsin-Pukow Railway, both of which are in the province of Shantung. The first is 284 miles in length, and was built with German capital for a German company, and opened for traffic in 1904. It connects the once-German port of Tsingtau with the capital of Shantung, province Tsinanfu.

**SWEDISH RAILWAY DIFFICULTIES.**—In order to secure the fullest possible utilization of its rolling stock, a special transport bureau has been set up in Sweden. The duties of this bureau are to allocate cars to consignees, and it has the power to prohibit the supply of cars to persons and firms who have not obtained its official authorization. Special arrangements have also been made to insure the best use being made of the locomotive stock, and to this end a system of close co-operation between the mechanical and operating departments has been introduced. The State Railways administration has also demanded Parliamentary sanction to spend £960,000 (\$4,665,600) for acquiring 60 locomotives and 600 freight cars. But, as in the case of the French and German railways, the Swedish administration has discovered that there is a great difference between giving orders and accepting delivery. Another Swedish difficulty is the serious coal shortage. Drastic remedies have had to be adopted to cope with all these handicaps. There have been temporary suspensions of freight traffic on the State lines, and passenger train-mileage, which was recently reduced by 12,750 km. (7,923 miles) a day, is being cut down still further. The company-owned lines have been asked by the Government to adopt similar measures.

## Railway Officers

### Executive, Financial, Legal and Accounting

H. G. Kelley, vice-president of the Grand Trunk, has assumed the duties of E. J. Chamberlin, president, who has been granted a three months' leave of absence.

E. D. Hogan, general manager of the Gulf, Mobile & Northern at Laurel, Miss., has been appointed vice-president and general manager, with headquarters at Laurel.

Herbert R. Wheeler has been appointed assistant treasurer of the St. Johnsbury & Lake Champlain, with office at Boston, Mass., vice Charles H. Nowell, resigned.

Marcus L. Bell, general solicitor for the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been elected general counsel, with the same headquarters. Mr. Bell was born at Pine Bluff, Ark., on January 11, 1880, and received his education at the University of Arkansas and the University of Chicago, graduating from the latter school in 1903. He entered railway service on June 27, 1904, as private secretary to the chairman of the executive committee of the Chicago, Rock Island & Pacific, with headquarters at New York. On January 1, 1905, he was promoted to assistant attorney at Chicago, and on November 1, 1906, became local attorney at the same place. On August 1, 1909, he was appointed assistant general attorney, and on April 1, 1910, was promoted to general attorney. On May 1, 1914, he became general solicitor, which position he held until his recent election by the board of directors as general counsel of the same road as above noted.

A. G. King, superintendent of the Canton Railroad at Canton, Md., has been appointed vice-president and general manager, and P. B. Luke has been appointed superintendent.

P. L. Fisher, assistant controller of the American Locomotive Company, with headquarters at New York, has been appointed general auditor of the Elgin, Joliet & Eastern, with headquarters at Chicago, succeeding F. W. Sutton, resigned.

Mongin B. Nichols, auditor of traffic of the Central of Georgia at Savannah, Ga., has been appointed auditor; William A. Rooks, auditor of disbursements at Savannah, has been appointed auditor of traffic, and Merle F. Harden, cost accountant at Savannah, has been appointed auditor of disbursements.

E. R. Dickenson, auditor of disbursements of the Denver & Rio Grande at Denver, Col., has been appointed general auditor, vice E. R. Murphy, retired on pension. The office of auditor of disbursements has been abolished, and all communications in connection with that department should in future be addressed to the general auditor.

William B. McKinstry, auditor of the Central of Georgia at Savannah, Ga., has been appointed controller of the Central of Georgia, the Wadley Southern, the Louisville & Wadley, the Sylvania Central and the Ocean Steamship Company, succeeding W. D. Beymer, resigned to go to another company. Mr. McKinstry was born on December 9, 1873, and began railway work in 1888, with the Michigan Central, at Chicago. He subsequently served on the Illinois Central, at Chicago, and in May, 1903, went to the Central of Georgia as a claim investigator.



M. L. Bell

He later served consecutively as traveling auditor, freight claim agent and then as auditor of the same road, which position he held at the time of his recent appointment as controller, as above noted.

H. W. Stanley, assistant to the chairman of the Commission on Car Service, at Washington, D. C., and formerly assistant to the president of the Seaboard Air Line, has been appointed a receiver of the Tennessee Central, with headquarters at Nashville, Tenn. Mr. Stanley was born on February 13, 1874, at Petersburg, Va., and after a grammar and high school education entered railway service in May, 1890, with the Norfolk & Western. He was consecutively telegraph operator, stenographer and chief clerk, and in 1895 became chief clerk to the superintendent of the Southern at Knoxville, Tenn. In 1897 he became secretary to the general superintendent of the Seaboard Air Line, and was later trainmaster, superintendent, superintendent of transportation, assistant general superintendent, general superintendent of transportation, and assistant general manager. In 1913 he was appointed general manager of the road, and on April 1, 1914, was appointed assistant to the president. He left the Seaboard Air Line on June 1, 1916, to engage in special work for the National Conference Committee of the Railways and the American Railway Association, and for the past several months has been assistant to the chairman of the Commission on Car Service at Washington, D. C.



H. W. Stanley

Charles Allen Goodnow, recently appointed vice-president of the Chicago, Milwaukee & St. Paul, has been in railway service for nearly half a century, and is well known as the man who has been in charge of the greatest railroad electrification project so far undertaken. This work, outlined in considerable detail in the *Railway Age Gazette* of February 2, 1917, is remarkable for the rapid progress made and the results achieved in a relatively short period. The contracts for equipment and material for the first unit of the project, the line between Three Forks, Mont., and Deer Lodge, were awarded in November, 1914. This was the first step in a scheme involving the electrification of 440 miles of main line between Harlowton, Mont., and Avery, Idaho. In November, 1915, overhead construction had been completed for a distance of 200 miles, and the 100,000-volt transmission line, which was erected by the railroad on its own right of way, had been completed for an equal distance, and the lines from the Montana Power Company were ready for service. The first of forty-two 282-ton electric locomotives was placed on a test track in September, 1915, and in February, 1917, steam engines were removed from the entire electrified section. A second section of line from Othello, Wash., to Seattle and Tacoma, is now being electrified, and will be ready for operation about the first of next year. Mr. Goodnow also constructed the Gallatin Valley



C. A. Goodnow

Railway, a subsidiary of the St. Paul, which runs from Three Forks, Mont., to Bozeman, and is now president of that line. In connection with the Puget Sound extension of the St. Paul, he supervised the construction of export terminal facilities at Seattle and Tacoma. Among the other interesting features of his active career were the making of the first time-table for operation through the Hoosac tunnel, the installation of the first interlocking plant in New England, at a point called Vermont; the introduction of two English staff machines for the protection of train movements over the Mississippi river bridge at Savanna, the perfection of the manual block system as now in use on the St. Paul, and the introduction of the floating system of handling freight on Puget Sound, which has since grown to important proportions. Mr. Goodnow was born at Baldwinville, Mass., on December 22, 1853. He entered railway service in 1868 with the Vermont & Massachusetts as a telegraph operator, and by steady application and native ability has won his way to the present executive position. In 1875 he became train despatcher of the Troy & Greenfield, and four years later was made trainmaster on the same road. From 1881 to 1886 he was superintendent of the New Haven & Northampton, and in the latter year went to the Chicago, Milwaukee & St. Paul as superintendent of construction. In 1888 he was promoted to division superintendent, with headquarters at Dubuque, Ia., and then served at Marion, and later was assistant general superintendent and general superintendent of the same road. In April, 1902, he was appointed general manager of the Chicago, Rock Island & Pacific, and in November, 1903, became general manager of the Chicago & Alton. From January 1, 1908, to January 1, 1913, he was assistant to the president of the Chicago, Milwaukee & Puget Sound, and on the latter date became assistant to the president of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he held until his recent appointment as vice-president.

#### Operating

O. H. Hagerman has been appointed manager of the marine department of the Philadelphia & Reading, with office at Philadelphia, Pa.

J. J. McDonell has been appointed chief despatcher on the Saskatoon division of the Canadian Pacific, with headquarters at Saskatoon, Sask.

H. J. Councilman has been appointed trainmaster of the Lake Superior division of the Northern Pacific, with headquarters at Ironton, Minn., effective July 1.

H. C. White has been appointed trainmaster of the 25th district of the Grand Trunk, with headquarters at Battle Creek, Mich., vice H. E. Bailes, transferred.

R. E. Casey, trainmaster of the Grand Rapids & Indiana at Ft. Wayne, Ind., has been appointed superintendent of the Northern division, with office at Grand Rapids, Mich., vice J. W. Hunter, deceased.

C. F. Strickland, freight agent on the Texas & New Orleans, with headquarters at Beaumont, Tex., has been appointed assistant superintendent with the same headquarters, succeeding A. L. Kuykendall, who has been transferred to Jacksonville, Tex.

D. S. Colby has been appointed trainmaster on the Dakota division of the Northern Pacific, with headquarters at Jamestown, N. Dak., and B. B. Johnson has been appointed terminal trainmaster on the Pasco division, with headquarters at Pasco, Wash.

C. B. Anderson, local agent of the Chicago & Eastern Illinois at Chicago, has been appointed superintendent of transportation, succeeding E. H. De Groot, Jr., resigned to become head of the newly organized division of car service of the Interstate Commerce Commission.

P. W. Sullivan, chief clerk to the general superintendent of the central system of the Pennsylvania, Lines West, has been appointed superintendent of the Akron division, with headquarters at Akron, Ohio, succeeding Nettleton Neff, furloughed for military service.

F. A. Leith, assistant superintendent of the Chicago, Terre Haute & Southeastern, with headquarters at Terre Haute, Ind., has been appointed superintendent, with headquarters at West

Clinton; C. D. Lynch has been appointed assistant superintendent, with headquarters at Bedford, Ind., and E. C. Sappenfield has been appointed chief train despatcher, with headquarters at Terre Haute.

E. M. Alvord has been appointed general superintendent of the Pittsburgh & West Virginia and the West Side Belt, with office at Pittsburgh, Pa., and the office of J. G. Code, general manager, has been abolished. Mr. Alvord was in the service of the Missouri, Kansas & Texas System from 1891 to 1910, first as superintendent of various divisions, and then during the last seven years as general superintendent, of the Northern lines. From 1910 to 1912 he served as vice-president and general manager of the Midland Valley, and then was engaged in private business, until his appointment on July 1 as general superintendent of the Pittsburgh & West Virginia, and the West Side Belt.

J. T. Gillick, who has been appointed assistant general manager of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, as has already been announced in the *Railway Age*



J. T. Gillick

*Gazette* of July 6, was born at Glencoe, Minn., in June, 1870. He entered railway service with the Chicago, Milwaukee & St. Paul in 1885, and was successively telegraph operator and train despatcher until 1903. In the latter year he was promoted to trainmaster, and three years later was appointed superintendent. In 1913 he became assistant to the general manager, with headquarters at Chicago, which position he held at the time of his recent appointment as assistant general manager, as already noted.

E. H. Martin, assistant superintendent on the Canadian Government Railways, with headquarters at New Glasgow, N. S., has been appointed superintendent with the same headquarters, succeeding L. S. Brown, promoted. W. A. Cowan, division engineer of the Transcontinental division, with headquarters at Cochrane, Ont., has been appointed general superintendent, with the same headquarters. K. Stewart, chief despatcher at New Glasgow, has been appointed assistant superintendent, with the same headquarters. L. S. Brown, superintendent, with headquarters at New Glasgow, has been appointed assistant general superintendent of the eastern lines, with headquarters at Moncton, N. B. J. H. Duff has been appointed assistant superintendent with headquarters at Grant, Ont.

F. E. Sanborn, superintendent of the Portland division of the Maine Central, at Portland, Me., has been appointed general superintendent, in charge of the transportation and car service departments, with office at Portland; F. J. Runey, superintendent of the South Mountain division, at Lancaster, N. H., succeeds Mr. Sanborn, and assistant superintendents on the Portland division have been assigned in charge of territory as follows: F. O. Wood, with office at Portland: Lines Portland to Leeds Junction; Leeds Junction to Lewiston Lower and Brunswick; Rockland branch; Brunswick yard and Brunswick to Royal Junction. T. M. McLaughlin, with office at Waterville: Waterville yard and lines Waterville to Bangor; Skowhegan branch; Belfast branch; Foxcroft branch and Harmony branch. G. H. Foster, with office at Waterville: Lines Waterville to Leeds Junction; Kineo branch; Waterville to Brunswick. E. L. Lovejoy, with office at Rumford: Lines Rumford Junction to Kennebago; Canton branch; Farmington to Leeds Junction, including Leeds Junction yard. J. Asnault, assistant superintendent at Calais, has been appointed superintendent of the Mountain division, with office at Lancaster, N. H., vice F. J. Runey, and the office of assistant superintendent at Calais has been abolished. W. A. Wheeler, chief despatcher at Bangor, has been appointed

assistant superintendent of the Eastern division, with office at Bangor and W. E. Kingston has been appointed chief despatcher at Bangor, vice Mr. Wheeler.

C. B. Brown, whose appointment as assistant general manager, Eastern Lines, and chief engineer of all lines of the Canadian Government Railway, with headquarters at Moncton, N. B., has already been announced in these columns, was born on August 27, 1879, at Ithaca, N. Y., and graduated as a civil engineer from Cornell University in 1901. He began railway work later in the same year with the Canadian Pacific, and served consecutively on that road as draftsman and rodman with the division engineer of construction at Trail, B. C.; assistant engineer in the bridge department, at Montreal, in charge of the erection of the Red River bridge at Winnipeg, Man., also the annexes to elevators at Fort William, Ont. From 1902 to 1904 he was resident engineer, District No. 2, Ontario division at London and Toronto, then became assistant division engineer of the Western division at Calgary, Alta. In 1906 he was appointed division engineer of the Atlantic division at St. John, N. B. Two years later he was transferred as division engineer to the Eastern division at Montreal, and from 1912 to 1913 he was principal assistant engineer of the Eastern lines of the same road at Montreal. He then served from 1913 to 1917 as chief engineer of the Canadian Government Railways at Moncton, N. B., and on June 1 was appointed assistant general manager, Eastern lines, and chief engineer, all lines, of the Canadian Government Railways, with headquarters at Moncton.



C. B. Brown

#### Traffic

W. L. McMorris has been appointed assistant general passenger agent of the Seaboard Air Line, with office at Norfolk, Va.

A. T. Weldon, assistant general freight agent of the Canadian Government Railways, with headquarters at Moncton, N. B., has been appointed general freight agent with the same headquarters, succeeding D. A. Story, promoted. M. F. Tompkins, division freight agent at Halifax, N. S., has been appointed assistant general freight agent, with headquarters at Moncton, succeeding A. T. Weldon, promoted. A. J. Gray, division freight agent at St. John, N. B., has been appointed assistant general freight agent with the same headquarters. J. H. Norton has been appointed division freight agent with headquarters at Halifax, succeeding M. F. Tompkins, promoted.

#### Engineering and Rolling Stock

W. R. Meeder has been appointed master mechanic of the Illinois Southern, with office at Sparta, Ill., succeeding W. F. McCarra resigned.

C. D. Rafferty has been appointed master mechanic of the Algoma Central & Hudson Bay, with office at Sault Ste. Marie, Ont., succeeding Thomas Fraser, resigned.

D. J. McCuaig, acting master mechanic of the Grand Trunk at Toronto, Ont., has been appointed master mechanic of the Ontario lines, with headquarters at Toronto.

F. B. Tapley, assistant engineer of the Canadian Government Railways at Moncton, N. B., has been appointed assistant engineer of maintenance, all lines, and will report to the chief engineer.

J. F. Deimling, assistant chief engineer of the Michigan Central at Detroit, Mich., has been appointed acting chief engineer,

vice George H. Webb, who has been commissioned lieutenant colonel in the Sixth Engineer Regiment, National Army. Effective July 1.

Joseph Slutzker, assistant master mechanic of the Pennsylvania Railroad at the Altoona (Pa.) machine shops, has been promoted to assistant engineer of motive power on the Western Pennsylvania division. Leon A. Starkweather, motive power inspector, has been promoted to assistant master mechanic on the New York division; and H. S. Schum, general foreman of the East Altoona enginehouse, has been appointed assistant master mechanic of the Altoona machine shops.

J. C. Beckwith, engineer of construction on the Canadian Government Railways, has been appointed division engineer, with headquarters at Moncton, N. B., succeeding H. T. Ruhl, resigned, to accept service with another company. A. V. Redmond, resident engineer at Cochrane, Ont., has been appointed division engineer with the same headquarters, succeeding W. A. Cowan, promoted. A. H. Willett, assistant division engineer, with headquarters at Cochrane, Ont., has been appointed resident engineer, with the same headquarters, succeeding A. V. Redmond.

F. G. Grimshaw, assistant engineer electrical equipment, Philadelphia Terminal division of the Pennsylvania Railroad, has been promoted to superintendent of motive power of the New Jersey division at New York, succeeding H. H. Maxfield; R. G. Bennett, assistant engineer of motive power of the Central division, succeeds C. D. Barrett as master mechanic at Sunbury; G. H. Watkins, assistant engineer of motive power of the Western Pennsylvania division, succeeds C. S. Gaskill as master mechanic at Orangeville, and J. H. Thomas, assistant general foreman at Pitcairn shop, succeeds F. S. Robbins as assistant master mechanic at Pittsburgh. Messrs. Maxfield, Barrett, Gaskill and Robbins have been granted furloughs to enter military service as officers of the Ninth Engineers, National Army, the railway shop regiment.

W. D. Warren, who has been appointed maintenance engineer of lines east of the New York, New Haven & Hartford, with office at Boston, Mass., as has already been announced in these columns began railway work as chainman and rodman for the Boston & Maine, and later served on the Pennsylvania Railroad. In 1903 he went to the New York, New Haven & Hartford as transitman, and then served consecutively on the New York Central as chief of party and on the Florida East Coast as resident engineer. He returned to the service of the New Haven in 1907 as division engineer of valuation, later becoming division engineer of the Providence division, which position he held at the time of his recent appointment as maintenance engineer of lines east of the same road, as above noted.

#### Purchasing

J. L. Feemster, storekeeper of the Kansas City Terminal Railway at Kansas City, Mo., has been appointed general storekeeper on the Chicago Great Western, with headquarters at Oelwein, Iowa.

#### OBITUARY

William P. Cosgrave, formerly superintendent of the Minnesota division of the Chicago & North Western, died at his home at Winona, Minn., on July 4. Mr. Cosgrave despatched the first train on the Chicago extension of the Chicago, Milwaukee & St. Paul, and in 1872 became assistant superintendent of the Chicago division of that road.

Frank J. Martin, assistant general freight agent of the New York, Chicago & St. Louis, with headquarters at Chicago, Ill., died at his home in Chicago on June 4. He was born at Cleveland, Ohio, on December 26, 1865, and entered railway service as a ticket clerk in the auditing department of the New York, Chicago & St. Louis in 1884. Later he was clerk in various capacities in the general freight department until September, 1905, when he was promoted to traveling freight agent. On September 10, 1905, he became agent of the Delaware, Lackawanna & Western at Chicago, and on April 1, 1907, he returned to the New York, Chicago & St. Louis as chief clerk in the general freight department. On September 14, 1909, he was promoted to assistant general freight agent.